

Home bias and distribution of bond mandates - Evidence from international corporate bond market during 2008 financial crisis

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Valtteri Anttila
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Abstract

In this thesis I study how home bias varies over time in context of international corporate bond underwriting. I observe that home bias in bank's country level underwriting portfolio increases by 27% on average when experiencing a crisis at its home market. The effect is limited to transparent and higher quality issuers, indicating homogeneous treatment of more opaque and lower credit quality issuers during crisis independent of their geographic origin. I also show that banks tend to withdraw to lesser extent from markets where underlying sovereign credit quality is higher than the one in their home market, suggesting that the shift is somewhat driven by flight to quality considerations.

Moreover, I find that banks treat their relationship client firms equally during crisis regardless of their home origin. I also show that increase in home bias is positively correlated with geographical distance between the issuer and the underwriting bank. I find no evidence that the increase would be less severe when the underwriting bank shares common familiarity characteristics with the issuer.

Keywords Bond underwriting, home bias, financial markets, financial crisis, bank competition

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1. INTRODUCTION

It has been widely documented in the past literature that investors diverge from optimal capital allocation by overweighting domestic assets in their investment portfolios. This phenomenon known as home bias has been observed to take place widely among investors regardless of their geographical origin, investor type or asset class they are investing to (see e.g. Ahearne et al, 2004; Gelos and Wei, 2005 and Butler, 2008). During the past 40 years researchers have sought source of this anomaly without finding a mutual consent on the fundamental reasons behind the phenomenon.

Global financial crisis burst out summer 2007 in US emerged discussion on mechanism which drove the transformation of the crisis between economies. It has been well acknowledged that deterioration in financial market conditions followed by cut in international capital flows led to global contagion in the financial market (see e.g. Milesi-Ferretti and Tille, 2011; Forbes and Warnock, 2012). Yet researchers have been unable to agree on the underlying reason determining the drastic change behind investors' preference to decrease their foreign exposures. First ones to approach this topic from home bias point of view have been Giannetti and Laeven who studied variation in home bias over time both in context of syndicated loan market and equity portfolios of US mutual funds (2012 and forthcoming). Their findings suggest that the cut in international capital flows can be attributed to investors' increased preference for local assets when uncertainty in the market gets more severe. Their results are independent of underlying asset characteristics suggesting overall increase in investors' risk aversion following the crisis.

In principle, investors experiencing a crisis at their home market become more risk averse and re-allocate their investment portfolio towards assets which they perceive to be less risky. If investors, at the same time, consider larger increase in riskiness of foreign assets compared to domestic ones they are induced to shift their investment portfolio towards their home markets and consequently increase home bias in their portfolio

In this paper I will study how home bias puzzle has altered in context of international corporate bonds, a source of funding which use has surged following 2007 crisis. More specifically I will concentrate on distribution of bond underwriting mandates from bond issuers to underwriting

banks. When a firm wants to seek funding from public debt market it needs to hire itself an underwriting bank which act as an intermediary between the issuer and bond investors in the market. Bank's ability to receive underwriting mandates is dependent on its capability to market and distribute the issues to potential investors compared to competing banks. I expect that both issuers and underwriting banks induce increased home bias in their decision making when uncertainty in the financial market increases. If this is the case, I will observe increased proportion of domestic issuers in bank's total underwriting pool when negative shock hits bank's home market.

When discussing home bias in this context it is good note that underwriter-issuer relationship is not formed by a decision solely made either by the issuer or the underwriting bank but it should be seen as a consequence of both (Fernando et al, 2005). Banks look for issuers who they regard capable to enter the market and issuers look for banks who are capable to distribute them to investors. Bearing this in mind, my results should not be interpreted unilaterally from bank's or issuer's point of view but they should be seen as an outcome of a mutual choice between the two parties.

1.1 Motivation for the research

International bond markets provide an interesting research framework for my study. Size of the market has doubled since the ongoing financial crisis burst in 2007. At the same time, volume of direct bank lending has decreased drastically emphasizing increased importance of market based funding sources ex-post the crisis. In part the shift from bank loans to public debt can be explained by tightening capital regulation standards on banks' capital adequacy determined in Basel II and Basel III frameworks. This has cut down availability of direct bank lending and forced borrowers to seek funding from other sources.

Competition between banks for bond underwriting mandates has been widely studied following deregulation of the global banking market in the turn of the 1990's. At the time, commercial banks were allowed to start to carry out underwriting services a business which was earlier dominated by investment banks. This let commercial banks that had traditionally been direct lenders utilize their knowledge from past relationships when competing for bond underwriting

mandates. It has been widely recognized in the literature that past lending relationship inducing monitoring incentive for the lender explains success of commercial banks in the underwriting market (see e.g. Gande, et al., 1997; Kang and Liu, 2007 and Yasuda, 2005). In my study I assess how past relationship between the bank and the issuer, either through direct lending or prior underwriting mandate alleviates increase in home bias when uncertainty increases in the market.

In home bias literature one reason for investors' diverge from optimal capital allocation has been proposed to emerge from familiarity factors (see e.g. Grinblatt & Keloharju, 2001 and Seasholes and Zhu, 2010). Familiarity reasons have yet gain little attention in literature when explaining variation in investors' behavior over time in debt capital markets. Most prevailing theories have been flight-to-liquidity and flight-to-quality which both overlook possible existence of behavioral reasons when explaining demand variations.

Although reasons behind home bias are found to be manifold existence of the phenomenon itself has been unquestionable. In my study, I seek to discover explaining factors for home bias in the context of bond capital markets and assess how importance of these factors vary within time. Existence of home bias in distribution of bond issue mandates has been previously found by Butler (2008) in US municipal bond market and Lau and Yu (2010) in international corporate bond market. To my knowledge no one has yet studied variation of home bias in distribution of underwriting mandates in the course of diverge economic conditions.

1.2 Main findings

I find existence of home bias in general throughout my results. When a bank experiences a crisis at its home market I observe increase of 27% in home bias of its monthly underwriting pool per country. The effect is limited to transparent and higher quality issuers, showing that banks treat more opaque and lower credit quality issuers homogeneously during crisis independent of their geographic origin. Moreover, the effect is no more present when excluding US and UK banks from my sample, indicating that banks outside these markets regard them as some sort of safe heaven during time of crisis. Also, the observed increase in home bias disappears when I limit my sample to markets where bank has had 10 or more underwriting mandates during the sample

period, suggesting that the effect is somewhat driven by larger withdrawal from less important markets.

I do not find more pronounced effect for issuers domiciled in emerging markets suggesting that my findings are not explained by level of development at issuer's home market. Increase in home bias remains similar when I limit my sample to higher credit quality issuers. I find no change in home bias for lower quality issuers when crisis hits bank's home market but I do find increased foreign bias when crisis takes place at issuer's home market.

I observe that higher level of institutional development in issuer's home country induces lower level of home bias in general. Banks are also more prone to withdraw from such distressed markets where availability of credit information is lower. When experiencing a crisis at their home market banks decrease their exposure to lesser extent in economies where sovereign credit rating is above the one in their home country. Similarly, when shock takes place at issuer's home market banks increase their foreign bias more for economies where sovereign credit quality is higher compared to their home economy.

I observe positive relation between bank's prior underwriting record and amount of foreign underwriting in general but I do not find evidence that increase in level of home bias would be lower for more reputable banks. When limiting my sample to issuers which enter the market for the first time, I find statistically significant increase in bank's foreign bias when uncertainty increases at issuer's home market. This indicates increased importance of certification role of foreign banks when issuer's credit quality is not yet known for the market. When entering the bond market for the first time information asymmetries between the issuer and potential investors are expected to be higher on average compared to issuers who have visited the market before. As crisis at issuer's home market is likely to accelerate this information asymmetry further it is important for the issuer to hire a foreign underwriter which can assess and certify its credit quality objectively to potential investors.

When regarding only issuers who have had a prior relationship with the underwriting bank, I observe lower level of home bias in general but no statistically significant change when negative shock takes place either in bank's home or host market. When limiting my sample to issuers for

whom the bank has not acted as an underwriter during the prior five years, I find clear existence of foreign bias in general. Explanation derives from the fact that banks are on average more likely to have a prior relationship with domestic than foreign issuers. As number of domestic issuers is limited bank looking for new underwriting mandates have to look these outside its home market. Interestingly, I find that banks further increase amount of their new foreign relationships when crisis hits their home market. This effect, together with bank's diversification efforts, is likely to be driven by deteriorating market conditions at bank's home country thus limiting number of new domestic issues in general.

I use set of different proxies to assess how importance of familiarity characteristics shared by the issuer and the underwriting bank varies over time. I find that level of home bias increases with geographical distance between the issuer and the underwriting bank when negative shock takes place at bank's home market. Conversely, when crisis hits issuer's home market banks increase their exposure more when issuer is geographically more distant. These results clearly indicate that the variation in home bias is associated with proximity.

I observe higher level of home bias in general when the underwriting bank has same national language or legal origin with the issuer but find no evidence that banks would withdraw to lesser extent from these markets when uncertainty increases. Moreover, during home based shocks banks limit their exposure to crisis by decreasing their foreign exposures more in markets within the same currency area. I also find that banks increase their exposure to distressed markets within the same currency area when their home economy is not in crisis.

1.3 Limitations of the study

As my research scope is rather extensive both geographically and across corporates from distinct industrial backgrounds it can be that I am unable to observe sources of home bias which are attributable to a specific subgroup in my sample. I seek to overcome this limitation by conducting tests on sub-sample level but it is likely that differences exist beyond the ones which I am able to track in this study. Comprehensive detection of these differences requires dedicated research on different sub-samples which goes beyond the scope of this study.

Another limitation emerges from research methodology. I am using monthly amount of underwriting mandates received by bank in a given market relative to total underwriting volume of the bank during the period as a dependent variable in my regression model. As I use observations aggregated at bank level, I am not able to detect how issuer specific characteristics influence underwriting behavior per se. In order to observe variation in bank's underwriting portfolio over time I have to treat underlying issue supply as a given constraint from the perspective of the bank.

Moreover, as my results are limited to period when crisis has emerged and continues till the end of my sample period I am not able to assess variation in home bias when economic cycle turns back to positive. Consequently, I am also not able to detect if my results are driven by some kind of universal change in market practices which continues beyond the crisis.

1.4 Structure of the paper

This paper is organized as follows. Section 2 introduces main theories related to the topic and main findings from the existing literature. Section 3 discusses my research problem and develops hypotheses. Section 4 describes the data. Section 5 develops the methodology I employ in this study. Section 6 reports the empirical results and robustness checks. Section 7 concludes.

2. BACKGROUND DISCUSSION AND LITERATURE REVIEW

2.1 Debt capital markets

2.1.1 Development of modern capital markets

Following the wave of deregulation which swept over banking sector in US in 1990's commercial banks were permitted to carry out underwriting and other investment banking services. Similar development took place in Japan where Financial System Reform Act was launched in 1993. In Europe integration of banking system was mainly driven by the Second Banking Directive implemented in 1989. These changes in regulation enabled banks to expand their business both geographically and in scope creating model of universal banking where same bank can carry on both commercial banking and investment banking services.

The emergence of the new banking model enforced agency problems which had traditionally been associated with commercial banks. Bank financing and related monitoring function creates bargaining power over borrower's profits for a lending bank compared to less well informed banks (Rajan, 1992). In the same vein universal banks offering bank financing for a specific firm face conflict of interest when acting as an advisor for the lender in capital markets. Better informed bank can exploit its information advantage by setting issuing firm's cost of capital higher than it would be in efficiently informed markets.

Findings in the literature have been contradictory what comes to effectiveness of the universal banking model from capital markets perspective. In their study on Japan market Kang and Liu (2007) find that bank with an information advantage face conflict of interest and expropriate rents from their borrowers in form of higher yields to appeal investors and gain market share in underwriting market. On the other hand, in the US certification role of universal banks has been found to offset conflict of interest both pre (Puri, 1996) and post 1933 Glass-Steagall act (Gande et al, 1997 and Yasuda 2005), showing that commercial banks transfer at least part of their competitive advantage to their borrowers in form of lower cost of capital when they enter securities underwriting business.

2.1.2 Role of intermediaries

Role of financial intermediaries has been extensively studied throughout the existence of capital markets. In their classical paper on role of intermediaries in financial market Leland and Pyle (1977) suggest that existence of intermediaries is primarily driven by information asymmetries between lenders and borrowers. Borrowers are not seen as credible information producers due to potential moral hazard they face even if markets function otherwise perfectly. Consequently, intermediaries are needed in the market to ensure information flows between the parties.

The first ones to touch the issue in security issuance framework were Booth and Smith (1986) who developed the classical certification model of financial intermediaries. According to Booth and Smith financial intermediaries are needed in the capital markets to mitigate information asymmetries between well informed corporate insiders and investors. When a firm decides to seek external financing from capital markets underwriting bank can put its reputation at stake to

certify credit quality of an issuer. Bigger is the information discrepancy between the issuer and investors in capital markets more resources it takes by the underwriting bank to fill in this gap.

As the underwriting bank has its own reputation at stake it's in its own interest to signal issuer's credit quality correctly to the market. Underwriters which have better access to inside information obtain competitive advantage over their less informed rivals. Less informed underwriters can offset this gap by allocating more resources to information retrieval but would then have to compensate increased costs by charging higher fees for their services. Underwriting bank can in a short run use less resources and signal issuer credit quality incorrectly but would consequently lose its reputation in the securities underwriting market.

Beyond their role as an information producer underwriting banks are responsible for marketing, pricing and selling the issue to the investors through capital markets and preparing related admin documentation.

2.1.3 Choice between bank loan and public debt

Company's debt financing has been traditionally seen as a choice between bank loan and public debt. Beyond issuer's credit quality debt source available for a specific issuer is determined by difference in marginal costs between the two options. Opaque companies with more sensitive information are, on aggregate, more costly to monitor. Consequently, they are more likely to rely on bank financing due to lower marginal cost associated with bank monitoring compared to monitoring by individual bond investors.

In his fundamental paper on corporate borrowing choice Diamond (1991) shows that there is an inverse relation between borrower's reputation and bank loans. Borrowers with higher credit quality have lower cost to access public debt markets and lower benefit of bank monitoring taking place when relying on bank financing. Oppositely, lower credit quality borrowers face higher cost of accessing public debt compared to cost they face when alleviating agency problems through bank monitoring.

As discussed by Giannetti and Laeven (2012) and Ivashina and Scharfstein (2010) volume in loan syndication market is primarily driven by banks' ability to carry risk. In the situation of adverse

economic conditions borrowers start to utilize their credit lines committed by banks. Higher utilization of credit lines increases banks' risk portfolio in general and put their own funding under pressure. This overall cut in availability of funding force banks to allocate their capital more carefully among their borrowers which leads to decrease in the aggregate amount of funds available in the loan market.

From bank's point of view arranging financing for a borrower through debt capital markets ties less capital in the long run, and is consequently less risky from financial point of view compared to traditional bank loan. In direct lending bank lends money from its balance sheet to borrower and assumes credit risk of the borrower throughout the lifetime of the loan. In bond issue bank's risk exposure is limited to underwriting period of the transaction, i.e. the time when bank sells the issue to investors in bond market.

2.1.4 Access to public debt market

When a company decides to issue a bond it needs to hire itself an underwriting bank or a syndication of banks. The underwriting can be made either on bought deal or open priced deal basis. In a bought deal underwriting bank or syndicate of banks commits to purchase the bonds or certain proportion of them from the issuer with a minimum providing the issuer an insurance against situation where the whole issue is not subscribed by investors. In an open priced deal underwriting bank or syndicate of banks markets the issue and sells it directly to the market on the offering day. Usage and appropriateness of the two above mentioned methods differ depending on the market and issue specific features. For the sake of simplicity I do not distinguish between the two methods and use them in parallel in this paper. Simplified process of the bond issue is presented in figure 1.

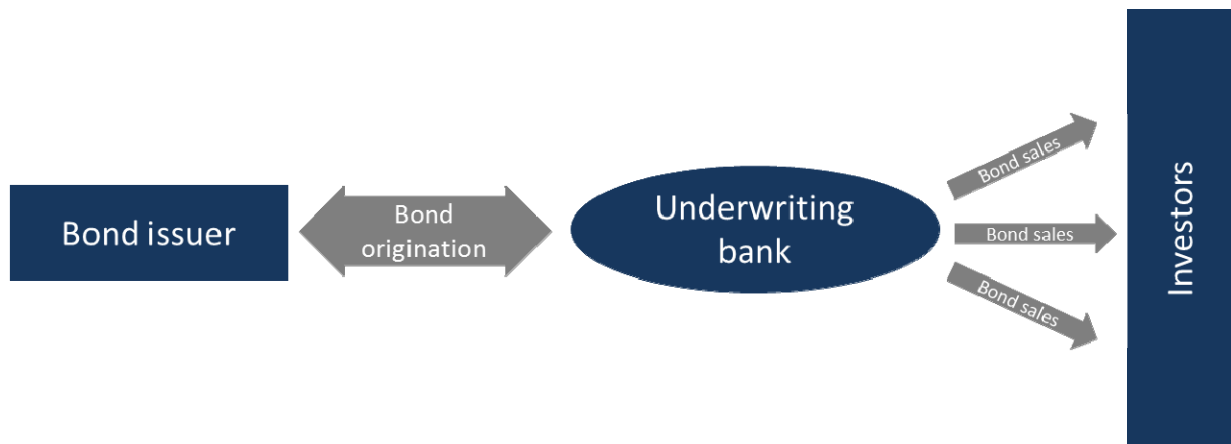


Figure 1
Simplified bond issue process chart. This figure presents bond issue process and its main counterparties.

From issuers perspective pivotal is how well underwriter is able to certificate the issue to potential investors in the market. Given underlying issuer characteristics well-known and established underwriters act as an assurance to investors leading to lower cost of capital and higher amount of funds available for a specific issuer in the market. Issuers are of course not homogenic and for some certification is more valuable than for others. Supportive findings have been made by both Puri (1996) and Yasuda (2005) who find that underwriters who have access to issuer specific information through their lending activities add most value for first time, junior, and informative sensitive issuers. This evidence strongly supports certification hypothesis and pinpoints special role that underwriters have as intermediaries.

Important to bear in mind when considering performance of public capital markets is that there is large variation in issuing volumes even on weekly basis. Demand for certain type of issuers in the market is largely determined by macroeconomic factors and overall market sentiment. When issuer wants to enter the market it needs to have good understanding of the current market mood and appetite for the type of issuer it is. This job is done by underwriters who offer their views of the market to the issuer and propose when the issuer should enter the market and with which price. Underwriters' opinions of market sentiment can vary largely and especially when uncertainty in the market is high possibilities to access the market are relatively short. In the end, underwriter who has the right understanding of the current market mood and the best knowledge of the issuer credit quality is likely to be chosen as an underwriter.

2.1.5 Pricing fundamentals

Cost of a bond issue for issuing company consists of fee paid to the underwriter(s) and yield investors are asking for the bond. Bank's compensation consists of gross spread which is difference between the total amount issued to the market and the amount received by the issuer. This gross spread covers bank's issue related expenses, such as marketing and preparation of related admin documentation and compensates for the risk of underwriting.

By theory bond pricing in the market should reflect issuing company's credit quality and features of the underlying security. In principle longer maturity and higher interest bearing securities should have higher yield (lower price). Higher credit quality and less opaque investors are able to issue their bonds with a lower yield leading to larger amount of capital raised from the market, *ceteris paribus*. Also from bank's perspective it is more costly to market and sell bonds of less well-known issuer. In addition, amount of information bank has over a specific issuer varies depending on the depth and length of relationship between the two.

Bank having concurrent lending relationship with an issuing company is found to have an informational advantage compared to non-lending rivals (Drucker and Puri, 2005). Underwriters at least partly transfer this cost saving to their clients in a form of lower underwriting fees and reduced cost of bank lending. Also opposing conclusions have been made. In a study by Hale and Santos (2009) authors find that issuers going for bond IPO face lower interest rate on their bank loans *ex-post* the issue stating that banks expropriate their informational monopoly *ex-ante* bond issuer entered the market for the first time.

Diverge from equity capital markets where underwriter compensation based on 7% spread has been found to be the norm (Chen and Ritter, 2000) bond market has not been found to suffer from this kind of distortion. The most obvious reason for nonexistence of universal pricing policy is heterogenic nature of the debt capital market both geographically and among distinct security classes.

2.2 Determinants of bond underwriter choice

2.2.1 Home bias

Existence of home bias in investors' capital allocation between domestic and foreign assets has been puzzling economists since its discovery in 1970s (Levy and Sarnat, 1970). This irrationality in investor behavior has aroused a vast amount of research where the phenomenon has been documented both among debt and equity investors (see e.g. Ivashina and Scharfstein, 2010; Ahearne et al, 2004). In recent home bias literature two alternative explanations for the existence of home bias have gained most attention: behavioral reasons driven by familiarity explanations (see e.g. Grinblatt and Keloharju, 2001; Seasholes and Zhu, 2010); and information asymmetries arising between investors according to their origin (see e.g. Coval and Moskowitz, 2001; Ivkovic and Weisbenner, 2005).

Information asymmetry explanation derives from the assumption that more proximate investors have better access to company specific information compared to distant players. Information advantage and resulting superior returns that local investors can gain have been studied among individual investors by Ivkovic and Weisbenner (2005). They show that US households are able to gain abnormal returns by preferring local equities in their equity portfolios. Similar finding among institutional asset managers has been made by Coval and Moskowitz (2001).

Contradictive finding has been made by Seasholes and Zhu (2010) who show that individual investors are not able to earn excess returns on their local stock portfolios but that home-bias is driven by investors' preference for familiar assets in general. Familiarity reason is also promoted by Grinblatt and Keloharju (2001) who find that investors in Finnish stock market tend to prefer equities of companies which are yet geographically closer but also sharing common language and cultural characteristics with investors. Authors also show that importance of these familiarity proxies tend to decrease with level of investor professionalism.

In their paper on information asymmetries and home bias Van Nieuwerburgh and Veldkamp (2009) argue that information asymmetries are reinforced by rational investors who decide to learn more about assets they already know in order maintain their information advantage. This leads to home-bias because investors have initially information advantage on local assets.

Supportive finding has been made by Bae et al (2008) who study performance of local and foreign equity analysts. They show that local analysts outperform foreigners and that their competitive advantage is inversely correlated with amount of publicly available information.

In the same vein it has been shown that financial intermediaries gain information advantage when they are located nearby their clients. These information advantages have been found to be significant both in equity (Loughran, 2008), bond (Lau and Yu, 2010) and syndicated loan market (see e.g. Sufi, 2007; Petersen and Rajan, 2002). However, it has been shown in context of bank lending that economies of scale bank can achieve through its centralized monitoring operations are limited because monitoring expenses tend to increase with level of diversification in bank's loan portfolio (see e.g. Acharya et al, 2006 and Laeven and Levine, 2007).

Francis et al. (2007) study relation between the location of issuing firm's headquarters and bondholders. They find that issuers located in remote rural areas where investor base is smaller face significantly higher cost of capital compared to issuers located in metropolitan areas where investors are located nearby the issuer. This is in line with presumption that monitoring is more costly for more distant investors and thus compensated through higher cost of capital for more distant issuers. Their finding is further supported by the fact such price anomaly does not exist for debt securities which are issued in private placement market. Private placement market has traditionally been dominated by institutional investors who are more strict in their monitoring policies and thus less prone to information asymmetries in general.

Information disadvantage of rural firms has also been studied by Arena and Dewally (2012). In addition to pricing implications, they find that debt issues of rural firms are characterized by smaller syndicate sizes; use of less prestigious underwriters; shorter maturities; and increased preference for relationship banking type of deals. They observe no relation between the firm location and its capital structure further supporting the evidence that observed differences are due to information disadvantage caused by distant location not by issuer specific traits.

Mian (2006) studied information asymmetries between lenders and borrowers in emerging markets and concluded that geographically more distant foreign banks are less likely to lend to firms operating in sectors of the economy where amount of soft information is high compared to

domestic lenders. Mian concludes that the result cannot be explained solely by geographical and cultural distance but that foreign banks are less likely to lend to certain sectors regardless of borrower's underlying credit quality.

Supportive evidence has been found by Giannetti and Yafeh (forthcoming) who show that large cultural differences between contracting parties lead to less favorable contracting terms for the borrower in the syndicated loan market. This effect on cost and size of the loan is robust even when culturally distant bank is lending repeatedly in the market. The bias is also not hampered by including culturally less-distant lenders to the syndication but characterized by reduced risk sharing by participants, i.e. relatively lower loan ticket of participating banks compared to lead bank's ticket when cultural distance between participating bank and lead bank increase.

Fidora et al (2007) study role of currency exchange values in explaining home bias. They find that foreign exchange values are an important factor determining home bias in bilateral capital flows between economies. Moreover, they show that variation in home bias following change in real exchange rate volatility is relatively larger for bond than for equity portfolios. Their findings are in line with flight-to-liquidity and flight-to-quality features of bond markets. If investors perceive increase in riskiness of foreign exchange risk in their bond portfolios they will shift their holdings to markets with strong base currency. Similar effect is not as prevailing in equity market where foreign exchange values are not as defining part of valuation.

2.2.2 Previous bank relationship

Large part of the literature on relationship banking has focused on divergencies between commercial and investment banks. Main reason for this direction of research has been emergence of unique research set up following the wave of deregulation in the banking sector at the turn of 1990s. Previous lending relationship between the issuer and the underwriting bank has been found to have positive and significant effects on both pricing and performance of the issue (Drucker and Puri, 2005). Similar finding has been made by Yasuda both in US (2005) and Japan (2007) bond market. In accordance with net certification hypothesis underwriters with access to issuer specific sensitive information, through lending or other concurrent business activities with

the issuer, will be seen as more reliable certifier of issuer credit quality in capital markets leading to lower cost of capital for the issuer.

Yasuda (2005 and 2007) studied issuer's probability to change underwriting bank and found that existing lending relationship between the issuer and underwriting bank reduces switching probability of underwriter by 32% in Japan and by 6% in US. Yasuda argues that large difference between the two is caused by differences in the banking systems. In Japan banking relationship is more valuable and changing of the bank costly, whereas in US pricing is market oriented and changing of the bank easier.

Findings outside US and Japan on net certification hypothesis have been somewhat contradictory. Klein and Zoeller (2003) found in their study on the German IPO market that IPOs underwritten by universal banks are more underpriced than IPOs underwritten by specialized investment banks, showing that investors require compensation due to potential conflict of interest of universal banks. Still, their results support the importance of pre-existing lending relationship in securities underwriter choice as issuers are willing to use universal banks as underwriters despite they could get more accurate pricing by investment banks. Ursel and Ljucovic (1998) studied IPO market in Canada and find that universal banks are as good or better underwriters than investment banks in terms of underpricing. Similar finding has been made by Benzoni and Schenone (2010) in US markets. Possible explanation for the difference in the results can again be seen in differences between market oriented financial system in US and Canada and bank oriented system in Germany.

Kanatas and Qi (1998) concentrate in their study on informational economies of scope universal banks can attain when offering combined lending and underwriting services. They show that it is optimal for a firm to use universal bank as an underwriter if the economies scope are larger than costs caused by conflict of interest. Hence, *ceteris paribus*, high quality firms are better off using universal banks as their underwriters compared to low quality firms because cost caused through conflict of interest is lower for the first mentioned. Correspondingly, low quality firms will prefer independent investment banks who don't face conflict of interest.

In a following study Kanatas and Qi (2003) study universal bank's incentive to place effort into underwriting services when it has achieved a strong relationship with a specific firm. Strengthened market power of a universal bank reduces its incentive to make costly underwriting efforts compared to independent investment bank. Universal bank can profit from ancillary business whereas investment bank opportunity is limited to one-off type security issue deals. Consequently, universal banks are performing worse in selling issuer's securities. Firms face a trade-off between benefiting from the informational economies of scope of a universal bank and capital market performance of an investment bank. As a result universal banks are likely to be chosen as an underwriter when economies of scope are large, i.e. amount of issuer specific sensitive information is high.

Incentives of universal banks to carry on investment banking services has recently studied by Loranth and Morrison (2012). They show that universal banks have incentive to grant loans to low quality borrowers who would otherwise be in threat to go bust. Bank would not grant the loan on standalone basis but possible profits available through investment banking operations in the future outweigh the negative expected return of the loan. This reduces borrowers incentives to exert effort to stay in budget because they anticipate that required financing is available at sub-optimal effort levels. From capital markets' perspective the implication can be expected to be relationship strengthening. Otherwise it would make no sense for a bank to grant the loan in the first place.

Relation between size of the syndication group and issue quality has been studied by Shivdasani and Song (2011) who argue that commercial banks enter to underwriting market led to usage of co-led syndicate structures in origination which lowered lead bank's incentive to monitor issuer quality. Authors compare issues between boom and bust market and conclude that on average lower quality issuers are able to access the market during boom periods when availability of funding is less scarce and investors' own monitoring incentives low. This phenomenon is found to be particularly strong in industries where commercial banks captured themselves a substantial market share following the wave of deregulation.

2.2.3 Underlying credit quality

Issuer credit rating given by an independent third party serves as an indicator of issuer's credit quality to outside investors. Issuer credit rating does not tell much about the potential information asymmetries in securities underwriting market as such but it can serve as a good proxy for amount of information available for outside investors in general. Supportive finding has been made by Butler (2008) and Lau and Yu (2010) who both show that issuer credit quality is inversely correlated with the distance between the issuer and underwriting bank. This implicates that credit quality alleviates information advantage which geographically more proximate banks gain through their location.

Disclosure requirements between countries have found to be one of the explanatory factors behind home bias puzzle of equity holdings (Ahearne et al, 2004). Authors study US investors' equity holdings in international context and conclude that information asymmetries and subsequent under investment is most prominent in countries where disclosure requirements are low. Supportive evidence has been made by Giannetti and Koskinen (2010) who found "good country bias" in international equity markets. In case of weak investor protection wealthy investors have an incentive to utilize their dominant position by acquiring large block of shares and expropriate profits from non-controlling shareholders. Taking this into account, less wealthy investors with no possibility to acquire controlling position, whether being domestic or foreign, will withdraw from markets where investor protection is low leading to preference towards countries with high level of investor protection.

Forbes (2010) studied the same phenomenon in US capital markets which has traditionally been in surplus and seen as one of the most developed financial market both in terms of liquidity and investor protection. Forbes argues that amount of foreign investment to US is inversely correlated with level of development of domestic financial markets. In the same vein, Butler (2008) finds in setting of US municipal bond issue underwriting that information asymmetry caused by issuer opaqueness leads to competitive advantage of more proximate underwriters. Similar finding has been made by Lau and Yu (2010) among international bond underwritings with a conclusion that proximate banks benefit most of their location in markets where investor protection is weak. Bae and Goyal (2009) show in their study on bank loans that banks adjust their contracting terms

according to level of legal protection in borrower's home country leading to smaller size, shorter maturity and higher pricing for borrowers located in countries where legal protection for the creditor is lower.

In country level study by La Porta et al (1997, 1998), authors find negative relation between investor protection set by national laws and size of local capital markets. The result is particularly prevailing in French civil law countries, signaling unfavorable environment for investors. Common-law countries are seen as one with the strongest level of legal protection, German and Scandinavian civil law countries located in between. In following study by Djankov et al (2007) authors found positive relation between legal creditor rights, information sharing system and amount of private credit to gross domestic product. According to their findings relation between creditor rights and amount of private credit to gross domestic product is more pronounced in richer countries whereas prevailing information sharing system is more decisive in poorer countries. Moreover, French civil law system characterized by strong government control is found to be most efficient legal system in less developed countries where need for public information sharing is higher.

2.2.4 Bank reputation

Underwriting bank's quality as an information producer is measured by its past performance in the capital market. Underwriters with strong track record have shown their ability to successfully place issues to the market. In order to create reputation as a credible underwriter bank has to utilize its resources to distinguish lemons from pears. Miss assessment of underlying credit quality will deteriorate underwriting bank's credibility to certify firm value, and as a consequence lead to higher cost of capital for issuers using the given bank as an underwriter in the future. In equity capital markets, Carter (1992) has shown that underwriter's likelihood to get a subsequent equity mandate from the same issuer is positively correlated with underwriter's reputation. Supporting finding has been made by Chemmanur and Fulghieri (1994) who found that underwriter's reputation is positively correlated with its ability to reduce information asymmetries in the equity market and the amount of capital raised through IPO. Moreover, authors show that underwriters subsequently over-pricing IPOs lose market share in the long run.

Also contradictory findings exist. Beatty and Welch (1996) studied equity IPOs from 1980 to 1994 and found that relation between underwriter's reputation and level of underpricing turned from positive to negative in period 1992-1994. Cooney et al. (2001) showed that this finding holds only for issues which are priced in the market outside their initial price range. More recent finding is made by Fernando et al. (2005) who show that there is a negative relation between market share of high reputation underwriters and overall issue activity and a positive relation between the quality of issues and overall issue activity, implicating that high reputation underwriters have more stable revenue streams than their less reputable competitors.

McKenzie and Takaoka (2008) study bond markets in Japan and find that deterioration in underwriter's credit rating between the first and second public bond issue significantly increases the probability of changing the underwriting bank. They also find evidence that lead underwriter who is able to increase the degree of overpricing of the first issue is more likely to be chosen as a lead underwriter for a subsequent offering.

Fang (2005) find in his study on US bond market that high reputation underwriters decrease the level of underpricing and charge higher fees for their services, thus producing increase in net proceeds for the issuer. In line with the positive relation between the certification role and underwriter reputation high quality underwriters are more cautious when underwriting junk bond issuers. Underwriters commit only to lower credit quality issues which they anticipate superior in their class. This "cherry-picking" leads to significantly larger price improvement for high yield issuers compared to investment grade category where this kind of selection is not found to be present.

2.3 Banking and capital allocation under adverse economic conditions

2.3.1 Flight-to-quality and Flight-to-liquidity

Well acknowledged fact in credit quality literature has been that investors' appetite for low quality assets decreases during economic downturns leading to shift towards higher quality assets. Lang and Nakamura (1995) studied this flight-to-quality phenomenon in loan markets and found countercyclical effect in bank lending, meaning that banks allocate their credits towards higher quality players when monetary policy in the country gets tighter.

Similar finding has been made by Bernanke et al (1996) but emphasis on agency costs of lending. Their findings suggest that borrowers with the highest agency cost face the most drastic shock in availability of credit following the change in economic conditions. In theoretical model by Vayanos (2004) it has been shown that flight to quality is associated with flight to liquidity. During periods of economic uncertainty volatility increases which leads to relatively larger increase in risk premium of less liquid assets.

Johnson et al (2000) studied role of corporate governance and particularly protection of minority shareholders' rights in relation to drastic currency depreciation and stock market decline during the Asian crisis of 1997-1998 in emerging markets. Their findings suggest that national legislation play an important role in transmission of external shocks. In related study Gelos and Wei (2005) studied flight to quality in context of both country and corporate level transparency in emerging markets and found robust evidence of investors' preference for transparency. On aggregate international investors tend to hold more transparent corporates in more transparent markets. During crises the flight away effect is strongest in countries with lowest level of transparency further supporting existence of high quality country bias.

Relation between credit quality and liquidity has been studied by Ericsson and Renault (2006) who found positive correlation between the two in US corporate bond market. Beber et al (2008) studied bond investors' preference between credit quality and liquidity in context of Eurozone sovereign bond market. They find that in principle bond investors prefer credit quality in their portfolios but in times of increased uncertainty they shift towards liquidity.

2.3.2 Increased familiarity bias

Anomalies in investors' behavior over time have also been found in context of equity portfolios. Bohn and Teaser (1996) found that international equity investors from US tend to allocate their investment portfolio according to past returns. Selling recent winners and buying recent losers leads to returns which are below the average in the market. Similar results have been presented by Kim and Wei (2002) during Korean crisis between 1997 and 1998. They show that return chasing behavior of foreign investors in Korean market reinforces during the crisis. Moreover,

domestic investors who used to be non-return chasers turn to be one when economic uncertainty increases.

Contradictive finding has been made by Curcuro et al (forthcoming) who show that US investors do not chase returns when allocating their international equity portfolios but that they on aggregate enter markets before boom periods. In recent study by Giannetti and Laeven (forthcoming) on US mutual fund portfolios authors show that local bias is reinforced during crises. Their results are not explained by superior performance of local stocks indicating existence of flight-to-familiarity effect during crisis.

Supportive evidence has been presented by Barberis (forthcoming) who argues that behavioral reasons and more precisely increase in investors' loss aversion following decreasing asset prices during financial crisis of 2007-2008 can in part explain investors' home bias during the crisis. As asset prices shrunk dramatically in relatively short period investors faced significant losses in their portfolios which made them to appraise downwards their own competence as an investor. As investors became more risk averse they started to prefer local assets which they regarded safer, hence increasing home bias in their investment portfolios.

Similar finding has been made by Guiso et al (2012) who show that investors' risk aversion increases ex-post negative experiences such as financial crisis. They suggest that variation in risk aversion and following increase in home bias can be at least partly attributed to psychological factors such as increased sense of fear. In their paper on risk aversion and past experiences Malmendier and Nagel (2011) show that past experiences indeed have a significant effect on individual's willingness to take risk. Their results are based on Survey of Consumer Finances for time period 1960-2007 indicating that past experiences have a long lasting effect on individual's risk aversion.

2.3.3 Flight home effect

Financial crisis burst in 2008 induced researchers to challenge traditional flight-to-quality explanations of capital allocation. It was widely observed during the crisis that banks' shift their capital towards home markets. Impact of bank's home-bias in capital allocation is not only limited to its position vis a vis its competitors in international banking markets but serves as a

shock transmission channel between the bank's home markets and host markets. Bank experiencing a crisis at its home markets transmits part of this shock to markets where it has clients by cutting down the supply of credit to that market. Interestingly this flight-home-effect has been found to be independent of credit quality, and hence in contradiction with the flight-to-quality explanations proposed earlier in the literature.

The phenomenon has been studied by Giannetti and Laeven (2012) in context of syndicated loan market. Authors show that drastic decrease in amount of capital available for borrowers through global syndicated loan market during crisis can be partly explained by home-bias in bank's capital allocation. Banking crisis taking place in bank's home market decreases probability that bank grants a loan to a foreign borrower by some 20%. Their results are independent of borrowers' credit quality suggesting that familiarity considerations play some role in bank's decision making while allocating capital to borrowers.

Similar finding has been made by Presbitero et al (2012) in their study on regional loan market in Italy. They show that during the crisis credit available to borrowers was cut down more severely in areas where distance between the local branch and bank headquarters is long. Moreover, inconsistent with flight-to-quality explanation, their result is found to be most prevailing among large and healthy firms. Somewhat contradictive finding has been made by De Haas and van Horen (2011) who find that previous lending relationship and syndicates formed with local banks alleviates foreign bank's home bias in loan origination during crisis. Their results suggest that information asymmetries would be an important determinant in bank's capital allocation puzzle.

3. HYPOTHESIS

Hypothesis 1: Bond issuers prefer geographically proximate banks when distributing underwriting mandates.

Investors' preference for local assets has been extensively observed across different asset classes and investor types (see e.g. Ahearne et al., 2004 and Curcuru et al, forthcoming). Supportive evidence from bond markets has been presented by both Butler (2008) in context of US municipal bonds and by Lau and Yu (2010) in framework of international bond issues. I expect that bond issuers' tendency to prefer domestic banks when distributing underwriting mandates

holds also when looking at distribution of received mandates at level of individual bank's total underwriting portfolio.

Hypothesis 2: Home bias in distribution of bond underwriting mandates increases during adverse economic conditions.

As found by Giannetti and Laeven both in syndicated loan (2012) and equity (forthcoming) portfolios investors' preference for geographically more proximate assets increase during crisis. The same is expected to hold when bond issuers distribute underwriting mandates to banks. As suggested already by Booth and Smith (1986) those intermediaries which have the best capability to certify issuer credit quality to potential investors should be chosen as underwriters. Whether driven by information asymmetries as argued by Coval and Moskowitz (2001) or familiarity reasons as framed by Seasholes and Zhu (2010) home bias in distribution of underwriting mandates is prone to increase with uncertainty.

Hypothesis 3: Increase in home bias is a result of bank's preference to underwrite higher credit quality issuers during crisis.

Nakamura (1995) followed by many others (see e.g. Bernanke et al, 1996) have suggested that change in capital flows during adverse economic conditions is driven by investors' increased preference for higher quality assets. I expect that same holds when banks seek for bond issue mandates. Higher quality issuers are less risky to underwrite, and hence bank's desire for such issuers increase following the crisis.

In the same vein, I expect that banks withdraw less from markets where institutional development and underlying credit quality in general is higher. Johnson et al (2000) have shown that investors are more prone to withdraw from distressed markets where investor protection determined by national legislation is low. Similarly, Gelos and Wei (2005) have found that investors withdraw to lesser extent from more transparent markets where availability of information in general is high.

Hypothesis 4: Prior relationship between the underwriting bank and the issuer alleviates increase in home bias.

As observed by Yasuda both in US (2005) and Japan (2007) bond markets underwriting banks with an existing lending relationship with the issuing firm are more likely to be mandated as an underwriter for a bond issue. In accordance with net certification hypothesis lending banks are assumed to have better access to issuer specific information, and hence have better ability to serve issuing firm compared to banks that don't have access to company specific information. I expect that this inside information is relatively more valuable when uncertainty increases, thus inducing smaller increase in home bias in case of foreign issuers who have had a prior relationship with the underwriting bank.

Hypothesis 5: Decrease in proportion of foreign underwritings during crisis is smaller for more reputable banks.

Chemmanur and Fulghieri (1994) have shown that there is positive relation between underwriting bank's reputation and its ability to reduce information asymmetries between the issuer and investors in equity markets. In a later study, Fernando et al (2005) have shown that underwriters with higher underwriting reputation are less prone to lose their market share when overall issue activity goes down. I hypothesize that bank reputation dilutes negative effects of home grown shocks, thus enabling reputable bank to retain its foreign market share. Moreover, I expect that bank with high prior bond underwriting volume is able to grow its market share in foreign distressed markets. Reputable bank has shown its ability to reduce information asymmetries. Consequently, its competitive position relative to less reputable banks strengthens as information asymmetries grow with increasing level of uncertainty in the market.

Hypothesis 6: Increase in home bias is less pronounced when the underwriting bank share common familiarity characteristics with the issuer.

Familiarity characteristics have found to breed home bias in stock markets and make investors to diverge from optimal capital allocation (Seasholes and Zhu, 2010). In the same vein, geographic proximity and common familiarity traits have found to explain capital allocation in Finnish

equity market (Grinblatt and Keloharju, 2001). I expect that same holds when bond issuers distribute underwriting mandates. As argued by Barberis (forthcoming), overall risk aversion increases following the crisis making market participants to prefer more familiar and seemingly less risky alternatives in their decision making. I expect that when sharing common familiarity characteristics with a foreign issuer bank is less likely to withdraw its exposure from the market.

4. EMPIRICAL METHODOLOGY

4.1 Methodology

Methodology of my study follows largely the one introduced by Giannetti and Laeven (2012) in their paper. Distinct from the reference paper where geographic proximity hypothesis is studied in context of syndicated loan market I will assess home bias in distribution of underwriting mandates in international bond markets. Whereas Giannetti and Laeven study bank lending decisions, i.e. direct bank lending, I will study issuer's choice of underwriting bank when it decides to enter bond market. Following the discrepancy in research context new control variables are introduced and some left out to better match the fundamentals of international bond markets. The control variables are discussed more in detail in the section 4.4.

I will assess value of underwriting mandates of international bond issues obtained by a given bank in a specific country in US dollars during a month relative to total value of underwriting mandates obtained globally by the bank. Notable is that I will use aggregated amount of underwriting mandates obtained by a specific bank during a month at country level. By using global amount of underwriting mandates as a denominator I can perceive changes taking place within bank's geographical underwriting portfolio given economic conditions. This enables me to capture changes in competitive position between banks rather than changes in overall issue volume or relation between issuer specific traits and market accessibility as done earlier by Butler (2008) and Lau and Yu (2010).

4.2 Base regression model

I will estimate base regression model using ordinary least squares. Underwriting share of a bank i of issues in country j during month t is modeled as follows:

$$Issue_{ijt} = \alpha_1 Foreign\ issue_{ij} + \alpha_2 Foreign\ issue_{ij} \times Shock\ bank\ country_{it} + \alpha_3 Foreign\ issue_{ij} \times Shock\ issuer\ country_{jt} + Domestic\ issues_{jt} + Shock\ bank\ country_{it} + vX_{ijt} + \varepsilon_{ijt} \quad (1)$$

where *Foreign issue_{ij}* is a dummy variable taking value 1 if the nationality of bank *i* is different from the nationality of the issuer, and zero otherwise; *Shock bank country_{it}* measures shock taking place in the home country of the underwriting bank; *Shock issuer country_{it}* measures shock taking place in the home country of the issuer; *X_{ijt}* is a vector of control variables; and ε_{ijt} is an error term.

A negative value for coefficient α_1 implies that there is home bias in bond underwriting market in general. More interesting from my study's point of view is coefficient α_2 : Negative value implying that fewer underwriting mandates are granted to foreign underwriters when economic shock in bank's home country takes place. Variety of issuer, country and bank specific proxies is used to find reasons for the anticipated change in competitive position. These control variables are described more in detail in the following section.

Interaction term *Foreign issue_{ij} x Shock issuer country_{jt}* is included in the regression to capture potential flight-to-quality effect. Negative value of the coefficient would imply that banks withdraw from foreign markets to home markets where they perceive underlying credit quality to be higher. In order to assess potential flight-to-quality I also study separately emerging markets which are traditionally seen as a market where outflow of capital is most apparent. More intensified withdrawal from emerging markets compared to developed markets would again promote existence of flight-to-quality effect.

Domestic issues_{jt} variable controls for volume of domestic underwritings at country *j* at time *t* relative to total issue volume in international bond market. In order to capture potential time-specific changes in the bond issue market I include year-month fixed effects to my regression model. To control for differences between issuer countries I include issuer country fixed effects. Time and issuer country fixed effects are also used to control for main effects of non-time invariant issuer country specific terms of my interaction variables, namely *Shock issuer country_{it}* interaction term. To do the same at bank country level I include *Shock bank country_{it}* as an independent variable to my model. When using three-way interaction, I include each interaction

term and its compound effect with other interaction terms as independent variables to my model when not controlled by interconnections of other independent variables in the model.

4.3 Regression variables

All regression variables and their descriptive statistics are presented in table 1. Variables are divided to four different sub-groups according to their origin. Bank-country-time group includes variables which are by their definition specific to a certain bank i in country j at time t . Country-time group include variables that are specific to country j at time t in general. Bank group includes variables which are attributable to a certain bank i and constant over the time period. Country group includes variables which are attributable to a certain country j and constant over the time period.

The main dependent variable is underwriting share which is constructed by taking monthly volume of underwritings by bank i in country j relative to total amount of international bond underwritings by the bank during the month. The main control variable for issue volume in country j is *Domestic Issues* which represents amount of underwritings done by domestic banks in country j at time t relative to total issue volume in the international bond market during that month. *Underwriting Share* and *Domestic Issue* variables are constructed correspondingly for different sub-samples.

Table 1

Descriptive statistics. Table displays summary statistics of the main regression variables. Bond issue variables are computed using data from SDC New Issues database. Country variables are gathered from World Bank's Global Economic Monitor, Doing Business and World Development Indicators databases if not specified otherwise. The sample consist of 11 144 observations over the period 2002-2011.

| Variable | Definition | Mean | St. Dev. | Median | N |
|---|---|--------|----------|--------|--------|
| Bank-country-time specific variables | | | | | |
| <i>Underwriting share</i> | Underwriting mandates granted to bank <i>i</i> in country <i>j</i> at time <i>t</i> /Total underwriting mandates granted to bank <i>i</i> at time <i>t</i> | 0.34 | 0.35 | 0.18 | 11 144 |
| <i>Underwriting share - quarterly data</i> | <i>t</i> as a quarter instead of a month | 0.24 | 0.32 | 0.08 | 7 886 |
| <i>Bias</i> | $Bias(ijt) = 1 - (Underwriting\ share(ijt) / Sharecountry(jt))$, where sharecountry (<i>jt</i>) is the proportion of the bond issues in country <i>j</i> with respect to the total amount of bond issues at time <i>t</i> | -20.36 | 111.88 | -1.97 | 11 144 |
| <i>Underwriting share - listed issuers</i> | Underwriting mandates granted to bank <i>i</i> by listed issuers in country <i>j</i> at time <i>t</i> /Total underwriting mandates granted to bank <i>i</i> at time <i>t</i> | 0.34 | 0.34 | 0.19 | 8 699 |
| <i>Underwriting share - non-listed issuers</i> | Underwriting mandates granted to bank <i>i</i> by non-listed issuers in country <i>j</i> at time <i>t</i> /Total underwriting mandates granted to bank <i>i</i> at time <i>t</i> | 0.24 | 0.32 | 0.10 | 3 766 |
| <i>Underwriting share – Investment Grade issues</i> | Underwriting mandates granted to bank <i>i</i> by IG rated issuers in country <i>j</i> at time <i>t</i> /Total underwriting mandates granted to bank <i>i</i> at time <i>t</i> | 0.34 | 0.34 | 0.19 | 9 023 |
| <i>Underwriting share – High Yield issues</i> | Underwriting mandates granted to bank <i>i</i> by HY rated issuers in country <i>j</i> at time <i>t</i> /Total underwriting mandates granted to bank <i>i</i> at time <i>t</i> | 0.19 | 0.27 | 0.07 | 1 499 |
| <i>Underwriting share – government involmnet</i> | Underwriting mandates granted to bank <i>i</i> by government-owned issuers in country <i>j</i> at time <i>t</i> /Total underwriting mandates granted to bank <i>i</i> at time <i>t</i> | 0.27 | 0.33 | 0.11 | 1 527 |
| <i>Underwriting share - first-time issuer</i> | Underwriting mandates granted to bank <i>i</i> in country <i>j</i> at time <i>t</i> by first-time issuers/Total underwriting mandates granted to bank <i>i</i> at time <i>t</i> | 0.29 | 0.33 | 0.14 | 4 686 |
| <i>Underwriting share - non-previous issuers</i> | Underwriting mandates granted to bank <i>i</i> in country <i>j</i> at time <i>t</i> by issuers whose bonds have not been previously(t-5) underwritten by the bank/Total underwriting mandates granted to bank <i>i</i> at time <i>t</i> | 0.88 | 0.24 | 1.00 | 7 979 |
| <i>Underwriting share - previous issuers</i> | Underwriting mandates granted to bank <i>i</i> in country <i>j</i> at time <i>t</i> by issuers whose bonds have been previously(t-5) underwritten by the bank/Total underwriting mandates granted to bank <i>i</i> at time <i>t</i> | 0.25 | 0.29 | 0.14 | 5 155 |
| <i>Underwriting share - loan relationship</i> | Underwriting mandates granted to bank <i>i</i> in country <i>j</i> at time <i>t</i> by issuers who have had a loan relationship with the bank (t-5)/Total underwriting mandates granted to bank <i>i</i> at time <i>t</i> | 0.26 | 0.28 | 0.15 | 3 070 |
| <i>Underwriting share - number of mandates</i> | Number of underwriting mandates granted to bank <i>i</i> in country <i>j</i> at time <i>t</i> /Total number of underwriting mandates granted to bank <i>i</i> at time <i>t</i> | 0.34 | 0.34 | 0.20 | 11 144 |
| <i>Average number of participants</i> | Average number of participants in issues underwritten by bank <i>i</i> in country <i>j</i> at time <i>t</i> | 4.92 | 3.81 | 4.00 | 11 144 |
| <i>Average issue size (USD million)</i> | Average total size of issues granted to bank <i>i</i> in coutry <i>j</i> at time <i>t</i> -12 | 626.49 | 353.68 | 593.56 | 8 861 |

Table 1 (continued)

| Variable | Definition | Mean | St. Dev. | Median | <i>N</i> |
|--|--|-------|----------|--------|----------|
| <i>Average spread (%)</i> | Average gross spread of an issue underwritten by bank <i>i</i> in country <i>j</i> at time <i>t-12</i> | 0.62 | 0.51 | 0.50 | 5 370 |
| <i>Average maturity (years)</i> | Average maturity of an issue underwritten by bank <i>i</i> in country <i>j</i> at time <i>t-12</i> | 8.63 | 4.01 | 8.00 | 8 145 |
| <i>Issue share in domestic currency</i> | Proportion of issues underwritten in country <i>j</i> at <i>t-12</i> in its domestic currency of the bank <i>i</i> | 0.38 | 0.38 | 0.22 | 10 900 |
| <i>Diversification</i> | Number of markets where bank <i>j</i> has acted as an underwriter at time <i>t-12</i> | 16.87 | 10.21 | 17.00 | 11 144 |
| Country-time specific variables | | | | | |
| <i>Domestic issues</i> | Underwritings by domestic banks in country <i>j</i> at time <i>t</i> /Total issue volume at time <i>t</i> | 0.05 | 0.10 | 0.01 | 11 144 |
| <i>Domestic listed issuers</i> | Underwritings by domestic banks to listed issuers in country <i>j</i> at time <i>t</i> /Total issue volume at time <i>t</i> | 0.04 | 0.08 | 0.00 | 8 699 |
| <i>Domestic non-listed issuers</i> | Underwritings by domestic banks to non-listed issuers in country <i>j</i> at time <i>t</i> /Total issue volume at time <i>t</i> | 0.03 | 0.05 | 0.00 | 3 766 |
| <i>Domestic government owned issuers</i> | Underwritings by domestic banks to government owned issuers in country <i>j</i> at time <i>t</i> /Total issue volume at time <i>t</i> | 0.00 | 0.01 | 0.00 | 1 527 |
| <i>Domestic first time issues</i> | Underwritings by domestic banks to first time issuers in country <i>j</i> at time <i>t</i> /Total issue volume at time <i>t</i> | 0.03 | 0.06 | 0.00 | 4 686 |
| <i>Domestic non-relationship issuers</i> | Underwritings by domestic banks to non-previous issuers in country <i>j</i> at time <i>t</i> /Total issue volume at time <i>t</i> | 0.04 | 0.07 | 0.00 | 7 979 |
| <i>Domestic bond relationship issues</i> | Underwritings by domestic banks to previous bond issuers in country <i>j</i> at time <i>t</i> /Total issue volume at time <i>t</i> | 0.03 | 0.06 | 0.01 | 5 155 |
| <i>Domestic loan relationship issues</i> | Underwritings by domestic banks to previous borrowers in country <i>j</i> at time <i>t</i> /Total issue volume at time <i>t</i> | 0.05 | 0.07 | 0.01 | 3 070 |
| <i>Domestic Investment Grade issues</i> | Underwritings by domestic banks to Investment Grade issuers in country <i>j</i> at time <i>t</i> /Total issue volume at time <i>t</i> | 0.04 | 0.08 | 0.01 | 9 023 |
| <i>Domestic High Yield issues</i> | Underwritings by domestic banks to High Yield issuers in country <i>j</i> at time <i>t</i> /Total issue volume at time <i>t</i> | 0.00 | 0.01 | 0.00 | 1 499 |
| <i>Shock bank country</i> | Dummy variable that equals one if the home country of the underwriter experiences a banking crises at time <i>t</i> , and zero otherwise | 0.48 | 0.50 | 0.00 | 11 144 |
| <i>Shock issuer country</i> | Dummy variable that equals one if the home country of the issuer experiences a banking crises at time <i>t</i> , and zero otherwise | 0.38 | 0.49 | 0.00 | 11 144 |
| <i>Market return in bank country</i> | % change in value of stock market index in home country of the bank | 0.01 | 0.05 | 0.01 | 11 107 |
| <i>Market return in issuer country</i> | % change in value of stock market index in home country of the issuer | 0.01 | 0.06 | 0.02 | 10 418 |

Table 1 (continued)

| Variable | Definition | Mean | St. Dev. | Median | <i>N</i> |
|---|--|--------|----------|--------|----------|
| <i>Emerging market</i> | Dummy variable that equals one if GDP per capita of the issuer country is below US\$10,000 for the year when issue takes place, and zero otherwise | 0.10 | 0.30 | 0.00 | 11 102 |
| <i>Credit information</i> | Depth of credit information index at issuer home country from World Bank's Doing Business database (1-7, low value indicating more availability of information) | 2.00 | 1.32 | 2.00 | 8 441 |
| <i>Legal rights</i> | Strength of legal rights index at issuer home country from World Bank's Doing Business database (1-11, low value indicating stronger creditor rights) | 3.76 | 2.03 | 4.00 | 8 441 |
| <i>Legal rights bank</i> | Strength of legal rights index from World Bank's Doing Business database in bank's home country | 2.90 | 1.68 | 2.00 | 8 602 |
| <i>S&P rating issuer</i> | S&P rating of the issuer country's government debt (1=highest) | 2.64 | 3.21 | 1.00 | 11 033 |
| <i>S&P rating bank - S&P rating issuer</i> | Underwriter home country's sovereign debt rating - <i>S&P rating issuer</i> | -1.14 | 3.31 | 0.00 | 11 032 |
| <i>Bilateral investment</i> | Proportion of direct investment from home country of the bank <i>i</i> to issuer country <i>j</i> during the year when the issue takes place from IMF's Coordinated Portfolio Investment Survey (CPIS) | 0.07 | 0.08 | 0.05 | 7 331 |
| <i>Issuer home country stock market size of GDP</i> | Total market value of listed companies in country <i>j</i> to total value of GDP at year end from World Bank's Global Financial Development database | 0.97 | 0.67 | 0.85 | 10 988 |
| <i>Large issuer</i> | Dummy variable that equals one if average pre-issue amount of issuers' total assets is above the mean total asset value during the sample period, and zero otherwise | 0.29 | 0.45 | 0.00 | 6 541 |
| Country specific variables | | | | | |
| <i>Religion match</i> | Dummy variable that equals one if prevailing religion in country <i>j</i> is the same as the one in bank <i>i</i> home country, and zero otherwise | 0.49 | 0.50 | 0.00 | 10 170 |
| <i>Legal environment match</i> | Dummy variable that equals one if prevailing legal system in country <i>j</i> is the same as the one in bank <i>i</i> home country, and zero otherwise | 0.48 | 0.50 | 0.00 | 10 170 |
| <i>Currency match</i> | Dummy variable that equals one if national currency in country <i>j</i> is the same as the one in bank <i>i</i> home country, and zero otherwise | 0.32 | 0.47 | 0.00 | 11 140 |
| <i>Language match</i> | Dummy variable that equals one if official language in country <i>j</i> is same as the one in bank <i>i</i> home country, and zero otherwise | 0.4293 | 0.495 | 0 | 11 144 |
| <i>Distance</i> | Log of physical distance in kilometers between the capital city of the issuer's country and the underwriter's country; zero for domestic issues | 6.24 | 3.40 | 7.30 | 11 046 |
| Bank specific variables | | | | | |
| <i>League table position</i> | Amount of total issues underwritten by bank <i>j</i> globally at t-12 / Total issue volume at t-12 | 0.16 | 0.12 | 0.15 | 11 144 |
| <i>Foreign underwriter</i> | Dummy variable that equals one if the underwriter's nationality is different from that of the issuer, and zero otherwise | 0.79 | 0.41 | 1.00 | 11 144 |

5. DATA

5.1 International bond issues

Bond issue data is obtained from SDC New Issues Database including information on issuers, underwriting banks, pricing and non-pricing terms at origination. Information is extracted for the period 2002-2011 including issues in 87 countries by 280 different banks from 53 different countries. All in all the data consists of 11 549 separate international corporate bond issues with a median issue amount of USD 325 million. In order to study evolution of specific bank's bond underwriting volume over time rather than changes in the total supply of bond issues I aggregate issues by a given bank during a month at country level.

I measure bank's underwriting activity as a dollar amount of bond issues where bank has been in bookrunner or joint bookrunner role. If a given issue is underwritten by more than one bank, i.e. bookbuilding is run by joint bookrunners, I have divided the total amount of the issue by number of bookrunners. This is likely to increase the underwritten amount per bank in my model compared to actual underwritten amount the bank has had in the issue due to fact that underwriters at lower level are ignored.

Same way as Lau and Yu (2010) I will exclude all financial sector issuers from my sample as these entities are such which are likely to act both as issuers and underwriters in the market. Moreover, financial firms operate in highly regulated market compared to corporates which is expected to be reflected also to the fundamentals of the market as such. If deemed, it would be more appropriate to study financials and corporates in two different sub-samples but extensiveness of such study goes beyond the scope of my research.

I will aggregate the data at parent bank level meaning that banks belonging to same bank group will be treated as one bank. As I use nationality of the bank to define whether the underwritten amount is treated as domestic or foreign use of subsidiary level bank observations would be problematic for two reasons. Firstly, a vast amount of banks have their capital market functions placed in subsidiary which is based in financial center different from their home country. This capital market subsidiary acts as an intermediary between the relationship bank and the issuer by

originating and executing the issue to the market. Treating these capital market subsidiaries as separate entities would cause error to my results as issues underwritten by them would be perceived to be underwritten by bank operating in different market where the relationship bank is actually based. Secondly, even if bank has local presence in a foreign country strategic decisions including allocation of bond origination resources are likely to take place at the bank's head office. Bank top management is likely to have the same nationality as the (parent) bank, and hence biased towards bank's home market in their decision making. Regarding bank's foreign branches or subsidiaries as separate entities would lead to larger amount of domestic observations in my sample although the decisive power would be at the parent bank level. This would be likely to dilute the home bias effect and lead to contradictive results in context of my study.

5.2 Other data sources

Country level data is extracted from multiple sources including World Bank, IMF and CIA Factbook databases. In order to separate emerging markets from developed markets I have extracted annual country level Gross Domestic Product from World Bank's World Development Indicators. Nations with GDP per capita less than USD 10,000 are regarded as emerging markets during the year of observation. All in all there are issuers from 55 countries which are regarded to be emerging market at some point of the sample period.

Annual bilateral investment from bank's home country to issuer's home country is from IMF's Coordinated Portfolio Investment Survey (CPIS). Data includes portfolio investment holdings in equity and debt securities by economy per source country. This data is not available for year 2011 at the time of writing of this study.

Information on legal system prevailing in country is as presented by Porta et al (1999) and CIA Factbook (2003). Legal systems are classified according to their origin to five groups: English, French, German, Nordic and Socialist. Dominant religion per country is extracted from Stulz and Williamson (2003) and CIA Factbook (2003). Nine religion classifications are Athiest, Buddhist, Catholic, Hindu, Indigenous, Judaism, Muslim, Orthodox and Protestant. National currencies are collected manually from multiple sources including Nations Online and CIA Factbook (2003).

Language data is extracted from CEPII GeoDist dataset and previously used by Mayer and Zignago (2011).

The depth of credit information and strength of legal rights indices are from World Bank's Doing Business dataset. The depth of credit information index measures rules affecting the scope, accessibility, and quality of credit information available through either public or private credit registries in a given country. In my sample the index ranges from one to seven, lower value indicating more availability of credit information. The strength of legal rights index measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders in the country. Index value varies between one and eleven, lower value indicating stronger legal protection.

Distance is natural logarithm of geographic distance in kilometers between capital cities of issuer and bank home country. Calculation is based on latitude and longitude of capital cities as presented by Gleditsch and Ward (2001).

5.3 Adverse economic conditions

To measure adverse economic conditions I obtain start and end dates of systemic banking crises from Laeven and Valencia (2010). They determine systemic banking crises to take place when there is signs of financial distress in the banking system (indicated by significant bank runs, losses in the banking system, and bank liquidations); and significant government intervention measures through changes in banking policies in response to losses faced by the banking system. First year when both of these conditions are met is used as a starting year of the banking crisis. End point of the crisis is defined as a year before both real GDP growth and real credit growth are positive at least for two consecutive years.

According to systemic banking crises data all in all 25 different countries faced a crisis during the sample period. 17 of these countries are regarded as a cases where the crisis is systemic (at least three out of five government interventions have taken place); and 8 as borderline cases (less than three government intervention measures have taken place).

I have constructed alternative crisis measure by taking monthly return of stock market index in country j from World Bank's Global Economic Monitor (GEM) database. Negative stock market return indicates existence of increased uncertainty whereas positive return is indication of normal market environment in the country during the month. All in all stock market index data is available for 66 out of 87 countries in my sample. Months with negative and positive stock market return observations total 3 655 and 4 928, respectively.

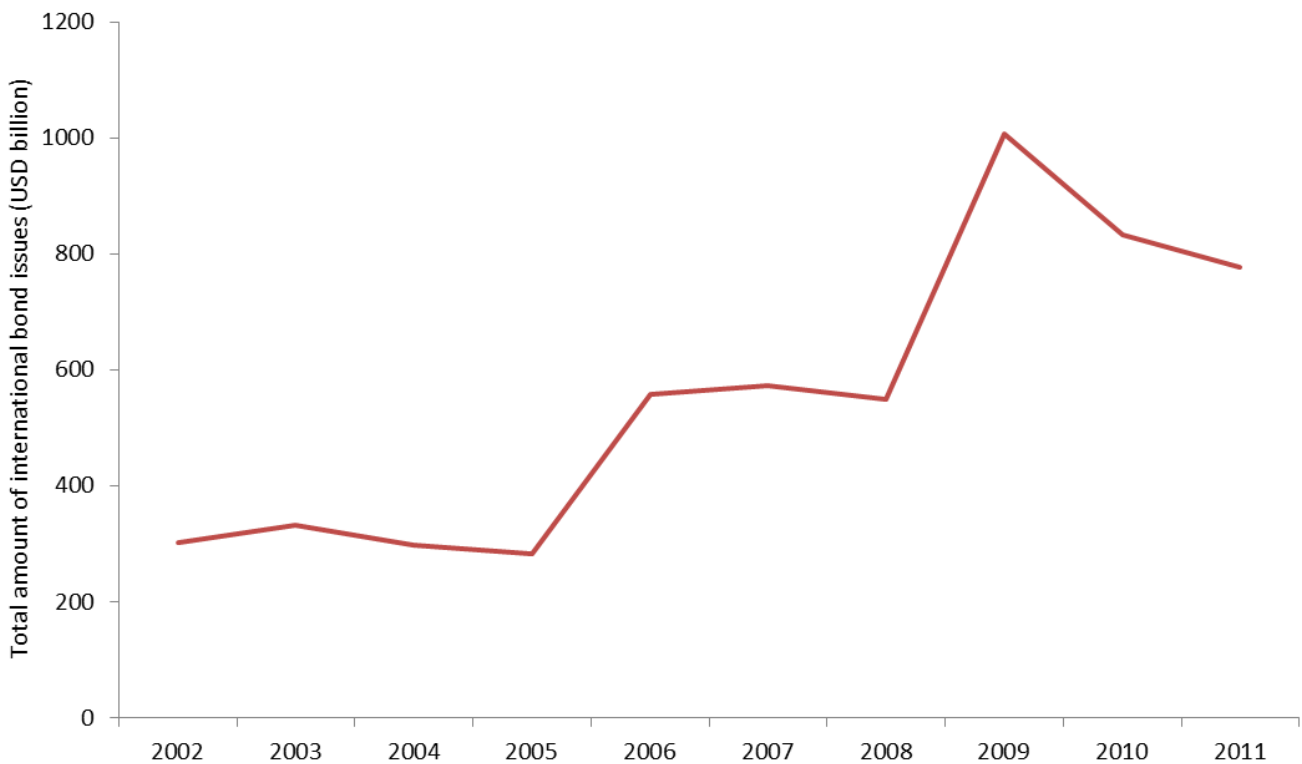


Figure 2

Total annual amount of international bond issues (USD billion) between 2002 and 2011. This figure shows total amount of international bond issues in USD billion globally in a given year during the period 2002-2011. Data is gathered from SDC New Issues database.

5.4 Stylized facts

Amount of capital raised from debt capital markets has altered remarkably over years. Figure 2 shows total amount of international bond issues at annual level. The size of the market over tripled from stable EUR 300 billion between 2002 and 2005 to EUR 1 000 billion in 2009. Strongest peak experienced year on year from 2008 to 2009 as the annual volume almost

doubled. Despite financial crisis hit the global financial market in 2008 funding from international bond market was still available for creditworthy corporates who rushed in to fulfill their funding needs. Average issue size at the time increased by 20% from previous year. One likely explanation for increased usage of bond financing is unavailability of funding from other sources at the time.

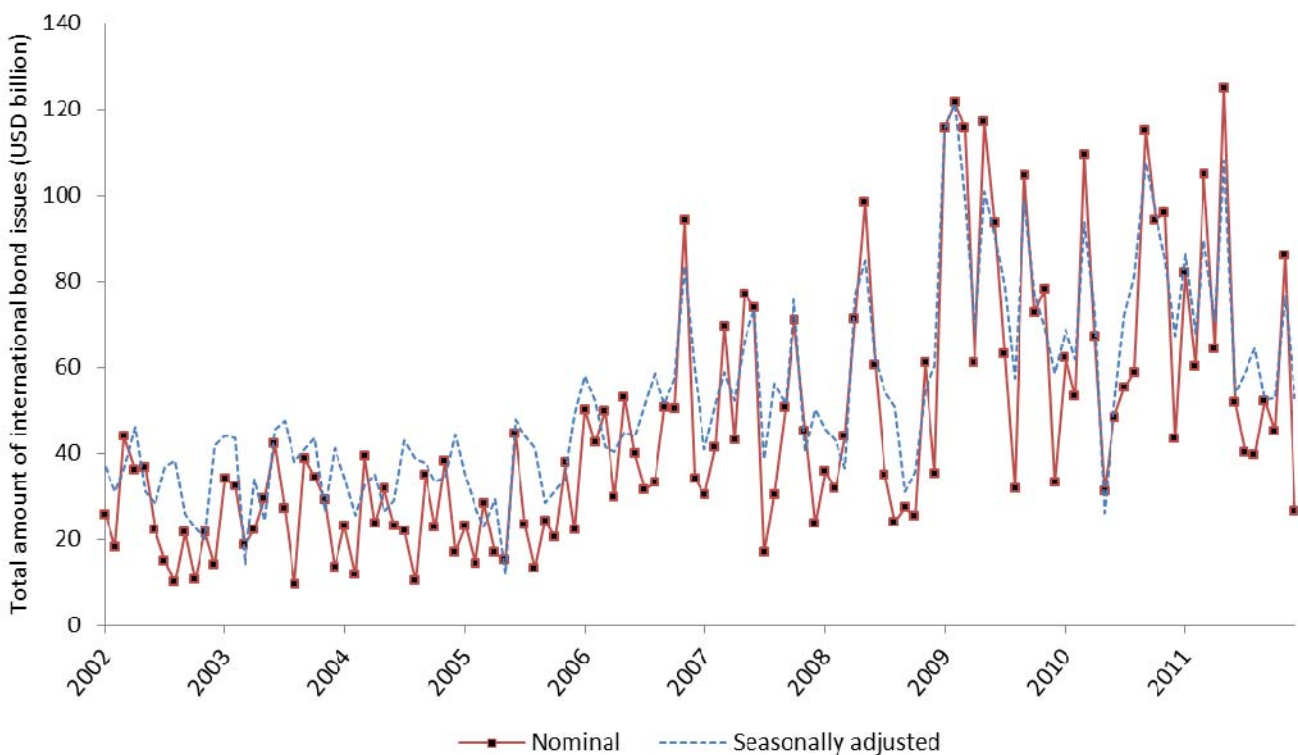


Figure 3

Monthly variation of international bond issue volume (USD billion) between 2002 and 2011. This figure shows monthly amount of international bond issues in USD billion globally in a given month during the period 2002-2011. Seasonally adjusted values are presented by dashed blue line. Data is gathered from SDC New Issue database.

In 2010 volume turned downwards and continued to decrease in 2011 as global economy struggled in crisis. As a consequence of sovereign debt crisis drop in 2010 was not as drastic as one could expect. Investors' appetite for high credit quality corporate borrowers remained strong as part of the demand was shifted from stressed sovereign bond market to corporate bond market where underlying issuer credit quality was less contended.

Monthly level issue volume is presented in figure 3. Large variation reflects relatively short market windows which are attributable to bond markets as for capital markets in general. When macroeconomic outlook is positive market is accessible to relatively larger number of issuers whereas during time of increased uncertainty macroeconomic fundamentals push the overall volume down. Notable is that volatility has gone up with the volume during the crisis period indicating increased importance of market windows. To relieve doubts that change in monthly issue volume would be driven by seasonal variations I have also included seasonally adjusted path to the figure.

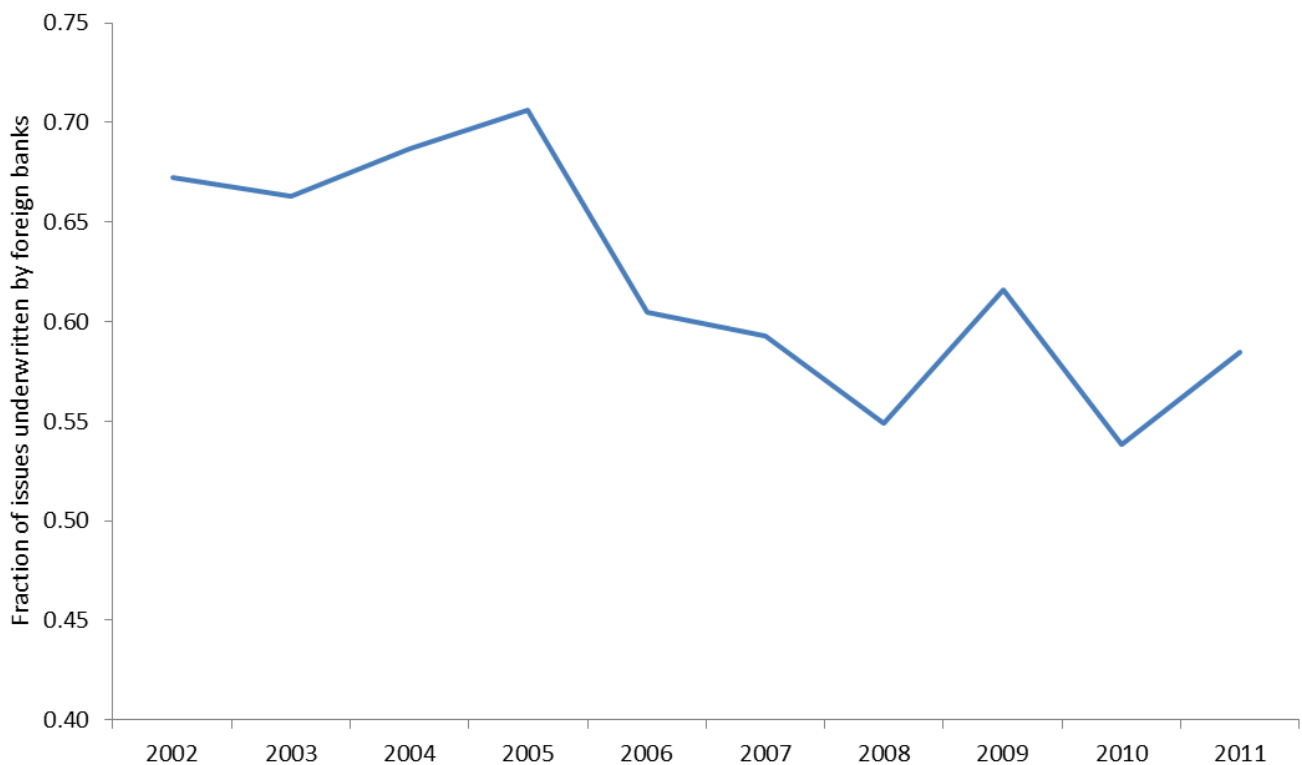


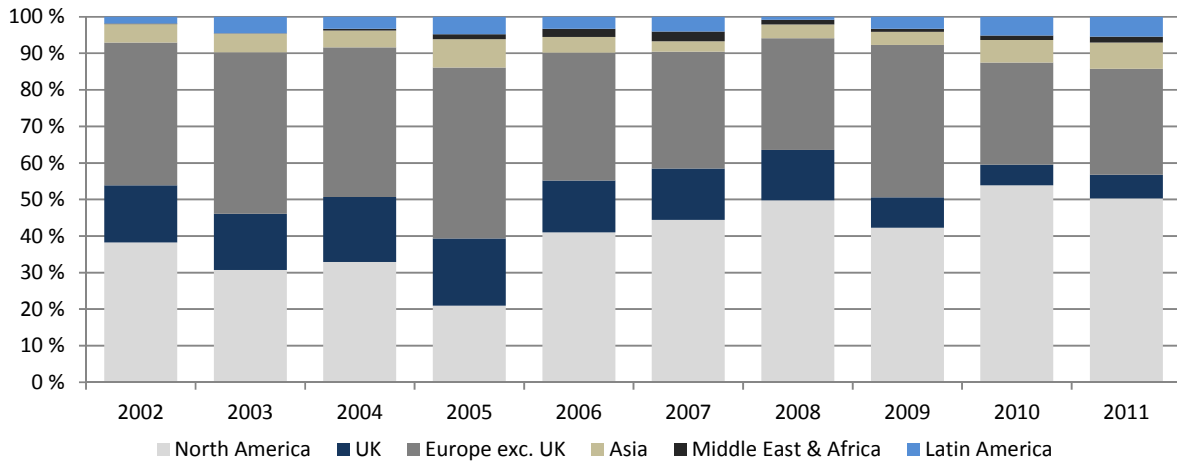
Figure 4

Proportion of foreign underwriters in international bond issues between 2002 and 2011. This figure shows proportion underwritten by foreign banks in international bond market during a given year in the period 2002-2011. Data is gathered from SDC New Issues database.

Figure 4 represents fraction of issues underwritten by foreign underwriters at annual level. Foreign underwriters share of international bond markets peaked at 71% in 2005 and decreased gradually to 55% in 2008. When the volume of international issues peaked in 2009 foreign

underwriters were able to recapture their market share. This can be in part explained by reputational advantage of large international banks vis a vis local players. Large international banks have more extensive distribution network, and hence access to larger pool of investors which is advantageous for the issuer looking for larger issue sizes.

Bond issuers



Underwriting banks

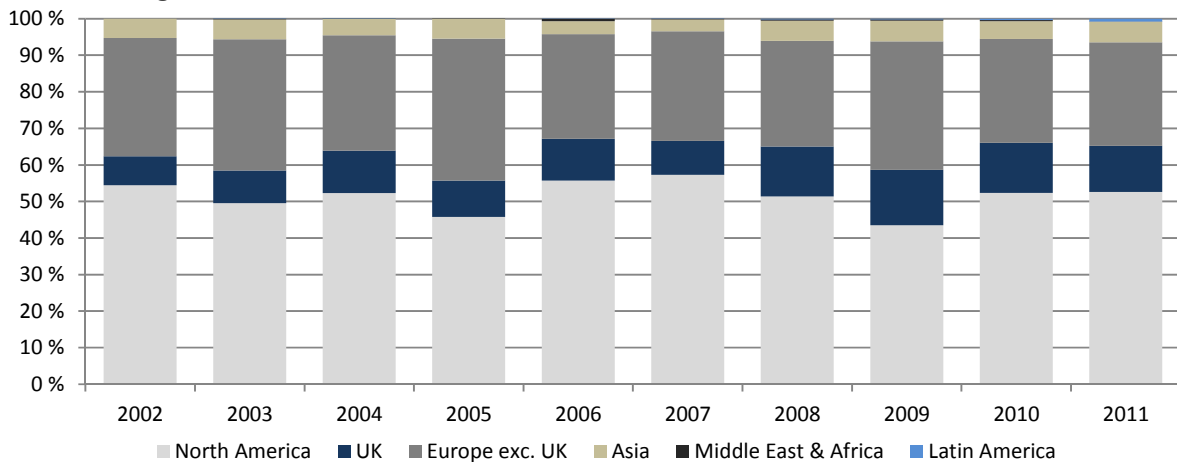


Figure 5

Geographical locations of issuers and underwriting banks over time. This figure shows geographical breakdown of total bond issue and underwriting volume during the sample period.

In 2010, underwriting share of foreign banks decreased from previous year by 8 percentage points to 54%. One explanation for simultaneous downward shift in overall issue volume and

foreign banks' market share can be drawn from macroeconomic conditions. Consequences of the financial crisis were most prevailing in US and UK economies where majority of large international banks are domiciled. As crisis hit their home market these banks cut down their foreign exposures and concentrated on home markets which they perceived less risky. Interesting is that fraction of foreign issues increased again in 2011 whereas the overall volume in the market kept going down.

Figure 5 presents geographical breakdown of total issue and underwriting volume per region at annual level during the sample period. It can be seen that proportion of North American issuers decreased in the market following the 2008 financial crisis. US issuers have returned to market in 2010 and 2011 whereas UK players are still at levels which prevailed in 2009. Notable is that proportion of underwritings by UK banks have been rather stable over time whereas it seems that US banks have suffered to a larger extent from the crisis. In overall it can be seen that amount of issues and underwritings from a certain geographic region somewhat follow each other over time.

5.5 Main effects

To assess explanation power of key variables of interest of my study I have included main interaction effects of shock and foreign dummy variables relative to *Underwriting share* dependent variable in table 2. Important to note is that these main effects tell little about the actual relation between dependent variable and interaction terms used in my regression model. They rather give some indication of the effect I will study in my model.

I find significant decrease on average amount of issues underwritten in foreign markets when crisis takes place in bank's home market. This effect is prominent throughout my results for different sub-samples. Notable is that similar effect does not take place at (1) *Full sample* level when looking at average amount of issues underwritten in home market of the bank. This gives some indication of increased home bias in distribution of bond issue underwritings when crisis takes place at banks home market. No conclusions can be made on course or magnitude of changes taking place when crisis hits issuer's home market.

I do find significant and negative effects when crisis takes place at issuer's home market for all sub-samples excluding (2) *NoUS and UK banks* and (4) *Listed issuers*. Observing such negative

relation in conjunction with increased home bias in my regression model would indicate that increased home bias for distressed banks is actually driven by demand variations taking place at issuer's home market. However, as I will later show, this is not the case but I rather find existence foreign bias for some sub-samples.

Table 2

Main interaction effects. Table presents interaction effects of *Foreign issue* dummy variable on *Shock bank* and *Shock issuer* dummy variables. Dependent variable is *Underwriting share*. *, ** and *** indicate significance at 10%, 5% and 1% level respectively. All different sub-samples used in this study are presented in order of appearance of regression models.

| Sample | Interaction terms | Sample mean | | Mean diff. | t |
|------------------------------------|---------------------------------------|-------------|-------|------------|--------|
| | | No shock | Shock | | |
| (1) <i>Full sample</i> | Domestic market - Shock | 0.644 | 0.635 | -0.009 | -0.66 |
| | Foreign market - Shock bank country | 0.334 | 0.190 | -0.143*** | -22.71 |
| | Foreign market - Shock issuer country | 0.261 | 0.272 | 0.011 | 1.57 |
| (2) <i>No UK & US banks</i> | Domestic market - Shock | 0.717 | 0.581 | -0.136*** | -4.35 |
| | Foreign market - Shock bank country | 0.383 | 0.233 | -0.15*** | -10.26 |
| | Foreign market - Shock issuer country | 0.318 | 0.297 | -0.021 | -1.41 |
| (3) <i>Important markets</i> | Domestic market - Shock | 0.561 | 0.718 | 0.157*** | 10.06 |
| | Foreign market - Shock bank country | 0.218 | 0.176 | -0.042*** | -6.17 |
| | Foreign market - Shock issuer country | 0.142 | 0.217 | 0.075*** | 13.50 |
| (4) <i>Listed issuers</i> | Domestic market - Shock | 0.535 | 0.602 | 0.066*** | 4.09 |
| | Foreign market - Shock bank country | 0.280 | 0.194 | -0.085*** | -10.01 |
| | Foreign market - Shock issuer country | 0.174 | 0.252 | 0.079*** | 11.71 |
| (5) <i>Non-listed issuers</i> | Domestic market - Shock | 0.430 | 0.239 | -0.191*** | -7.16 |
| | Foreign market - Shock bank country | 0.224 | 0.074 | -0.15*** | -12.61 |
| | Foreign market - Shock issuer country | 0.127 | 0.099 | -0.028*** | -3.48 |
| (6) <i>Government involvement</i> | Domestic market - Shock | 0.640 | 0.293 | -0.347*** | -5.25 |
| | Foreign market - Shock bank country | 0.264 | 0.125 | -0.139*** | -6.26 |
| | Foreign market - Shock issuer country | 0.209 | 0.126 | -0.083*** | -3.50 |
| (7) <i>Investment grade issues</i> | Domestic market - Shock | 0.604 | 0.546 | -0.058*** | -3.81 |
| | Foreign market - Shock bank country | 0.336 | 0.198 | -0.138*** | -19.40 |
| | Foreign market - Shock issuer country | 0.277 | 0.264 | -0.013* | -1.71 |
| (8) <i>High yield issues</i> | Domestic market - Shock | 0.426 | 0.296 | -0.131*** | -2.76 |
| | Foreign market - Shock bank country | 0.202 | 0.118 | -0.084*** | -6.29 |
| | Foreign market - Shock issuer country | 0.163 | 0.134 | -0.029** | -2.15 |

6. FINDINGS AND ROBUSTNESS CHECKS

6.1 Bond underwriter choice and adverse economic conditions

Existence of home bias in bond issue underwriter choice can be found throughout my results. As can be seen from column 1 in table 3 underwriting share per country is lower by 0.27 for banks which act as an underwriter outside their home country. Coefficient values for *foreign* variable remain robust throughout my results.

Table 3

Home bias and adverse economic conditions. The dependent variable is underwriting share. Column 2 is modeled using Tobit regression. Column 3 includes issuer home country fixed effects. Column 4 takes into account crisis taking place in issuer's home market. Column 5 includes countries where underwriting bank has had at least 10 underwriting mandates during the sample period. Column 6 excludes US and UK based banks from the sample. Column 7 uses data aggregated at quarterly level. Sample consists of 11 144 bank-country-month observations over the period 2002-2011. See table 1 for variable definitions. T values are presented in parentheses; standard errors (not presented) are corrected for heteroskedasticity and clustered at the bank level; *, ** and *** indicate significance at 10%, 5% and 1% level respectively.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|--------------------------------------|---------------------|----------------------|----------------------|-----------------------------|------------------------------|-----------------------|----------------------|
| | | Tobit | Issuer country FE | Issuer country crisis | Important markets only | No US and UK banks | Quarterly data |
| Foreign issue | -0.27*** (-9.82) | -0.28*** (-29.11) | -0.29*** (-10.69) | -0.29*** (-10.73) | -0.31*** (-8.8) | -0.35*** (-8.69) | -0.36*** (-13.59) |
| Foreign issue * Shock bank country | -0.1*** (-2.68) | -0.11*** (-7.94) | -0.08*** (-2.61) | -0.08** (-2.29) | -0.02 (-0.71) | -0.06 (-1.11) | -0.07** (-2.04) |
| Foreign issue * Shock issuer country | | 0.02*** (3.3) | | 0.00 (-0.04) | -0.03** (-2.01) | 0.01 (0.19) | 0.01 (0.83) |
| Domestic issues | 0.53*** (4.48) | 0.5*** (16.67) | 0.95*** (9.51) | 0.95*** (9.38) | 1.14*** (13.67) | 0.58*** (3.7) | 0.85*** (5.2) |
| Shock bank country | -0.14 (-1.63) | -0.13*** (-9.29) | -0.16** (-1.98) | -0.16** (-2.08) | -0.15** (-2.22) | -0.11 (-1.15) | -0.13* (-1.89) |
| Issuer country FE | No | No | Yes | Yes | Yes | Yes | Yes |
| Time FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 11 144 | 11 144 | 11 144 | 11 144 | 8 673 | 5 792 | 7 886 |
| R-squared | 0.29 | 0.47 | 0.31 | 0.31 | 0.39 | 0.27 | 0.36 |

Existence of reinforced home bias during adverse economic conditions can be interpreted from *Foreign issue * Shock bank country* variable, negative value indicating that amount of foreign issues underwritten by banks experiencing crisis at their home market decreases. From column 1 in can be seen that proportion of foreign underwriting decreases by 37% when crisis takes place in the home market of the bank. Domestic banks have closer ties and better visibility over domestic issuers compared to foreign banks. Bank can eventually be very dependent on issuers

which come from same home market as these firms are also likely to be the ones which bank has most ancillary business. During uncertain times it is in bank's best interest to allocate its resources to home market in order to support relationship with domestic firms that on aggregate can be expected to be the ones which are the most profitable for the bank in the long run.

In column 2, I have constructed my regression using Tobit methodology instead of Ordinary Least Squares. As my dependent variable by definition can vary between 0 and 1 use of Tobit model would be justified but relatively large amount of control variables I will use in later regressions could create problems. For the sake of consistency I will use OLS methodology throughout my study. As can be seen from column 2 results using Tobit regression are similar with the ones given by OLS.

Domestic issues variable is positive and statistically significant throughout my results suggesting that perceived home bias is not driven by demand variations in the issuer's home market. Insignificant or negative value of *Domestic issues* variable would suggest that variation in domestic issue volume could be explained by local demand shocks, i.e. decreasing total issue volume in country j during month t . Clearly this is not the case. To make sure that my results are not driven by variation in global issue volume over time I have also included time fixed effects to all my regressions.

In column 3, I include issuer country fixed effects to my model. Together with time fixed effects, issuer country fixed effects control for main effects of *Foreign issue * Shock issuer country* variable interaction term same way as *Shock bank country* regression variable does for *Foreign issue * Shock bank country* interaction term. In some of my regressions *Shock bank country* variable gets a statistically significant negative value indicating that shocks at bank's home country lead to lower underwriting activity in overall for the given bank. When controlling for main effects of interaction terms in my model observed variation in home bias decreases by 10 percentage points to 27%.

In order to ensure that my results are not driven by shocks taking place in the issuer's home country I have included *Foreign issue * Shock issuer country* variable to my regression. Negative value of the variable would indicate that observed decrease in foreign underwritings would be at

least partly explained by decreasing underwriting volume in host markets experiencing crisis simultaneously with bank's home market. As suggested by Epstein (2001) in his paper on ambiguity aversion explanation of home bias bank experiencing a crisis at its host market would decrease its exposure to that market due to increased risk perception caused by its impaired ability to evaluate issuers in that market. As shown in column 4, I find no evidence of such effect.

In column 5 I have included only issues from countries where the bank has underwritten at least 10 issues during the sample period. Although there is clear home bias of around 0.31 for domestic issues in general I find no increase in home bias during crisis at bank's home market. Here the *Foreign issue * Shock issuer country* variable gets negative and statistically significant value indicating that banks decrease their exposure to markets where uncertainty increases. Intuitively one could argue that this would be more probable in markets where bank is less active, i.e. in countries where bank has had below 10 underwritings during the sample period. This seems not to be the case. It shows that my results are somewhat driven by shocks taking place at bank's host markets. However, in some of my later regressions I find this variable to be positive and statistically significant indicating that banks increase proportion of foreign underwritings in markets where uncertainty increases.

To relieve possible problems caused by dominance of US and UK banks I have excluded banks domiciled in these countries from my sample in column 6. This cuts my sample size by almost 50% and turns *Foreign issue * Shock bank country* variable insignificant. Consequently, my results are somewhat driven by US and UK banks. It seems that although there is home bias in general for banks outside US and UK they do not withdraw their foreign underwriting resources when hit by crisis at home. One possible explanation is that these banks regard US and UK markets to be safe haven, hence promoting existence of bias towards US and UK markets during uncertain times. This is consistent with flight to quality explanation which I discuss more in detail in the following section.

To reduce concerns that my results would be driven by previously observed large variation in monthly issue volume I have reconstructed the data on quarterly basis in column 7. The results remain robust showing that increased home bias is not explained by banks' tendency to enter

foreign markets during months when issue volume is high, and exit respectively when the monthly volume is low.

Table 4

Home bias and different issuer types. The dependent variable is underwriting share. Column 1 shows results when dependent variable is constructed using listed issuers only. Column 2 considers only non-listed issuers. Column 3 represents results where only issues by issuers that are wholly or partially government owned are considered. Sample consists of 11 144 bank-country-month observations over the period 2002-2011. See table 1 for variable definitions. T values are presented in parentheses; standard errors (not presented) are corrected for heteroskedasticity and clustered at the bank level; *, ** and *** indicate significance at 10%, 5% and 1% level respectively.

| | (1) Listed issuers | (2) Non-listed issuers | (3) Government owned issuers |
|--------------------------------------|-----------------------|---------------------------|------------------------------------|
| Foreign issue | -0.24*** (-9) | -0.21*** (-6.2) | -0.29*** (-5.13) |
| Foreign issue * Shock bank country | -0.08** (-1.98) | -0.01 (-0.35) | -0.01 (-0.12) |
| Foreign issue * Shock issuer country | 0.01 (0.41) | 0.02 (0.58) | 0.01 (0.17) |
| Domestic listed issuers | 0.84*** 6.23 | | |
| Domestic non-listed issuers | | 0.85*** (4.04) | |
| Domestic government owned issuers | | | 3.2*** (3.41) |
| Shock bank country | -0.16** (-2.11) | -0.29*** (-3.04) | -0.21 (-1.51) |
| Issuer country FE | Yes | Yes | Yes |
| Time FE | Yes | Yes | Yes |
| Observations | 8 699 | 3 766 | 1 527 |
| R-squared | 0.27 | 0.28 | 0.36 |

Table 4 represents regression results for different issuer types. Results remain qualitatively similar for listed issuers presented in column 1. For two other sub-samples I find no change in level of home bias when crisis takes place either in bank's home or host market, indicating that observed increase in home bias is somewhat driven by increased preference for domestic listed issuers which on aggregate are more transparent compared to non-listed issuers. Interestingly, value of *Foreign issue* variable is smaller for non-listed issuers than listed or government owned issuers. In line with classical net certification hypothesis of Booth and Smith (1986), non-listed issuers being in principle less transparent than listed issuers are more dependent on large foreign banks when raising funds from international bond markets. These banks are more credible certifiers from foreign investors' point of view compared to domestic underwriters. Relatively

highest home bias found for government owned issuers suggests that domestic banks perceive underlying credit quality differently for these issuers compared to foreign banks. Moreover, government owned firms, especially if they are under tight control of government itself, might want to allocate issue mandates towards domestic banks in order to boost domestic economy.

6.2 Flight-to-quality explanations

So far I have shown that home bias in distribution of bond underwriting mandates increases when crisis hits the home market of the underwriting bank. However, it is possible that observed increase in home bias is actually a reflection of some other source driving underwriting activity towards home markets. One possibility is that underwriting banks reallocate their origination and execution resources to issues which they perceive to be of higher quality. Next I will assess whether my results hold when controlling for the underlying credit quality.

To see if observed home bias is simply consequence of banks' withdrawal from host markets which are hit by crisis, and hence perceived to be riskier, I have excluded such observations from my model in column 1 in table 5. This seems not to be the case as my results remain similar even when only healthy host markets are taken into account. To further assess influence of host market credit quality I have included *Emerging markets* dummy variable to my model. Distinct treatment of issuers coming from emerging and advanced markets would signal that my results are driven by flight-to-quality rather than home bias. As can be seen from column 2 this is not the case. Emerging market status seems to increase home bias in general as suggested by negative and statistically significant value of *Emerging market * Foreign issue* coefficient but no increase is observed when shock takes place in bank's home country. Similarly, I don't find evidence of shift towards home markets when crisis takes place in foreign emerging market.

In column 3 and 4 I have split my data according to issuer's underlying credit quality. Interestingly home bias for high yield issuers is found to be smaller than for investment grade issuers in general. Again, this promotes existence of net certification role of foreign banks. When shock takes place in bank's home market, home bias in distribution of investment grade issuers' underwriting mandates increases by 27%, a figure which is equal to one observed for the whole sample. I find no statistically significant change for high yield issuers. Notable is that *Foreign*

*issue * Shock issuer country* for high yield issuers is positive and statistically significant, promoting existence of foreign bias towards lower credit quality issuers when hit by crisis at their home market.

Table 5

Issuer credit quality. The dependent variable is underwriting share. Column 1 represents results when issues from host countries under crisis are excluded from the sample. Column 2 includes emerging market dummy variable. Column 3 considers only issues by investment grade issuers. Column 4 considers only issues by high yield issuers. Sample consists of 11 144 bank-country-month observations over the period 2002-2011. See table 1 for variable definitions. T values are presented in parentheses; standard errors (not presented) are corrected for heteroskedasticity and clustered at the bank level; *, ** and *** indicate significance at 10%, 5% and 1% level respectively.

| | (1) Non crisis host countries | (2) Emerging market | (3) Investment Grade issues | (4) High Yield issues |
|--|--|---------------------------|--------------------------------------|-----------------------------|
| Foreign issue | -0.29*** (-10.34) | -0.27*** (-10.16) | -0.26*** (-8.74) | -0.18*** (-3.36) |
| Foreign issue * Shock bank country | -0.28*** (-3.1) | -0.11*** (-2.64) | -0.07* (-1.82) | -0.08 (-1.41) |
| Foreign issue * Shock issuer country | | 0.00 (0.26) | 0.02 (0.79) | 0.06* (1.7) |
| Domestic issues | 0.81*** (6.53) | 0.94*** (9.37) | -0.22 (-1.33) | -0.29 (-0.45) |
| Shock bank country | | -0.14* (-1.81) | -0.17** (-2.15) | -0.13 (-1.49) |
| Emerging market | | 0.29*** (3.37) | | |
| Emerging market * Foreign issue | | -0.36*** (-4.54) | | |
| Emerging market * Foreign issue * Shock bank country | | 0.04 (1.2) | | |
| Emerging market * Foreign issue * Shock issuer country | | -0.08 (-1.25) | | |
| Domestic Investment Grade issues | | | 1.14*** (6.06) | |
| Domestic High Yield issues | | | | 4.35** (2.41) |
| Issuer country FE | Yes | Yes | Yes | Yes |
| Time FE | Yes | Yes | Yes | Yes |
| Observations | 6 884 | 11 102 | 9 023 | 1 499 |
| R-squared | 0.30 | 0.32 | 0.26 | 0.31 |

In order to assess development of financial markets beyond distinction made between emerging markets and developed markets I have split my sample using set of proxies to measure level of institutional development in bank's home and host market. In column 1 of table 6, I have constructed my sample using proxy of quality and accessibility of credit information in issuer's home market by including *Credit information* control variable. Results support my earlier

findings. I find higher degree of home bias for issuers which come from markets where availability of credit information is low. However, the effect is not found to be more pronounced when crisis takes place in bank's home market. Negative and statistically significant value of *Credit information * Foreign issue * Shock issuer country* variable indicates that increase in bank's home bias is more pronounced in foreign markets where availability of credit information is low.

In column 2, I control for strength of legal rights in home country of the issuer. As found with availability of credit information there is stronger home bias in general when legal environment in the home country the issuer is weaker. I find no variation in home bias when crisis hits banks home market but I observe increased withdrawal from distressed markets where legal protection is low. These findings suggest that banks shift their underwriting portfolio towards markets where institutions are strong when perceiving increased uncertainty at their host markets. However, this flight-to-quality effect does not help to explain the observed home bias when bank experiences a crisis at its home market. This, together with my earlier observation of increased foreign bias for high yield issuers, indicates that banks experiencing a crisis at their host markets shift their underwriting portfolio towards lower quality names but only if these issuers are from markets where institutional protection in general is high.

In order to assess whether strong legislation in bank's home market could explain pronounced home bias during crisis periods I have included strength of legal rights in home country of the underwriting bank to my model. Banks from strong legal environments withdrawing their foreign exposures more than banks coming from countries where legal protection is low would indicate that that flight-to-quality explanation carries some explanative power over my results. This would not abolish flight-home explanation of my results as such but would rather indicate that there is some interrelation between the two.

Table 6

Market specific traits. The dependent variable is underwriting share. Column 1 and 2 include depth of credit information and strength of legal rights dummy variable from World Bank's Doing Business database at issuer's home market (low value indicating more availability of information and stronger legal protection). Column 3 controls for legal rights at bank's home market. Column 4 includes difference in sovereign rating between the underwriting bank's and issuer's home country. Column 5 considers issuer home country's stock market size relative to Gross Domestic Product. Sample consists of 11 144 bank-country-month observations over the period 2002-2011. See table 1 for variable definitions. T values are presented in parentheses; standard errors (not presented) are corrected for heteroskedasticity and clustered at the bank level; *, ** and *** indicate significance at 10%, 5% and 1% level respectively.

| | (1) | (2) | (3) | (4) | (5) |
|---|---------------------|---------------------|---------------------|----------------------|--------------------------|
| | Credit information | Legal rights | Legal rights bank | Sovereign rating | Stock market size of GDP |
| Foreign issue | -0.17*** (-2.62) | 0.00 (-0.14) | -0.28*** (-9.69) | -0.29*** (-11.06) | -0.53*** (-9.33) |
| Foreign issue * Shock bank country | -0.08 (-0.93) | -0.17** (-2.16) | -0.09** (-2.42) | -0.06 (-1.6) | 0 (-0.08) |
| Foreign issue * Shock issuer country | 0.05** (1.96) | 0.03 (0.97) | 0 (-0.07) | 0.00 (-0.17) | 0 (-0.14) |
| Domestic issues | 0.92*** (7.88) | 0.87*** (7.44) | 0.88*** (7.91) | 0.94*** (9.27) | 0.96*** (8.92) |
| Shock bank country | -0.18** (-2.28) | -0.07 (-0.63) | -0.1 (-1.24) | -0.15** (-1.99) | -0.19** (-2.16) |
| Credit information | 0.08*** (2.58) | | | | |
| Credit information * Foreign issue | -0.09*** (-2.6) | | | | |
| Credit information * Foreign issue * Shock bank country | 0.01 (0.44) | | | | |
| Credit information * Foreign issue * Shock issuer country | -0.02** (-2.55) | | | | |
| Credit information * Shock bank country | 0.00 (0.00) | | | | |
| Legal rights | | 0.08*** (4.17) | | | |
| Legal rights * Foreign issue | | -0.08*** (-4.22) | | | |
| Legal rights * Foreign issue * Shock bank country | | 0.02 (1.28) | | | |
| Legal rights * Foreign issue * Shock issuer country | | 0.00 (-1.13) | | | |
| Legal rights * Shock bank country | | -0.01 (-0.91) | | | |
| Legal rights bank | | | -0.02** (-2.12) | | |
| Legal rights bank * Foreign issue | | | 0.00 (-0.75) | | |
| Legal rights bank * Foreign issue * Shock bank country | | | 0.00 (-0.34) | | |
| Legal rights bank * Shock bank country | | | 0.00 (0.22) | | |

Table 6 (continued)

| | (1) | (2) | (3) | (4) | (5) |
|--|-----------------------|-----------------|-------------------------|---------------------|-----------------------------------|
| | Credit information | Legal rights | Legal rights bank | Sovereign rating | Stock market size of GDP |
| S&P rating issuer home country | | | | 0.01 (-1.38) | |
| (S&P rating bank-S&P rating issuer) * Foreign issue * Shock bank country | | | | 0.01*** (2.59) | |
| (S&P rating bank-S&P rating issuer) * Foreign issue * Shock issuer country | | | | 0.02*** (4.23) | |
| Issuer home country stock market size of GDP | | | | | -0.18*** (-6.21) |
| Issuer home country stock market size of GDP * Foreign issue | | | | | 0.21*** (6.13) |
| Issuer home country stock market size of GDP * Foreign issue * Shock bank country | | | | | -0.02 (-0.42) |
| Issuer home country stock market size of GDP * Foreign issue * Shock issuer country | | | | | 0.01 (0.46) |
| Issuer home country stock market size of GDP * Shock bank country | | | | | -0.02 (-0.39) |
| Issuer country FE | Yes | Yes | Yes | Yes | Yes |
| Time FE | Yes | Yes | Yes | Yes | Yes |
| Observations | 8 441 | 8 441 | 8 602 | 11 032 | 10 988 |
| R-squared | 0.37 | 0.39 | 0.33 | 0.33 | 0.34 |

Results in column 3 show that proportion of foreign issues in general is not higher for banks which come from countries where legislative protection is lower. Negative value of *Legal rights bank * Foreign issue * Shock bank country* would indicate that the home bias during crisis is more pronounced for banks who come from markets with stronger legal rights. I find no statistically significant evidence of such effect.

In column 4 I have added sovereign rating of the issuer's home country and its difference compared to sovereign rating of bank's home country as a control variable. I find no evidence that bank's underwriting portfolio would be in general more pronounced towards issuers coming from countries where sovereign credit quality is high. When bank's home country experiences a banking crisis, bank seem to withdraw less from markets where sovereign credit rating is higher than the one in their home market. Same effect prevails when financial turmoil takes place in issuer's home market. Results indicate that flight-to-quality effect explains the earlier observed increase in home bias to some extent.

Size of national stock market can be considered to serve as a proxy for importance of domestic capital market in general. Large size of stock markets in issuer's home country indicates that capital markets are important source of funding for firms domiciled in the country. Larger markets can also be seen to be more liquid and efficient, *ceteris paribus*. In order to see if banks shift their underwritings towards issuers coming from countries where capital markets are relatively more important I have included stock market size relative to GDP variable to my model. Results are presented in column 5. There is bias towards issuers coming from markets where relative size of the stock market is large as coefficient *Issuer home country stock market size of GDP * Foreign issue* is positive and statistically significant. However, I find no statistically significant change in bank's home bias when it experiences a crisis either at its home or host market.

6.3 Issuer-bank specific traits

Next I will assess how much the observed increase in home bias can be explained by issuer and bank specific traits. Results are shown in table 7. Column 1 includes *Large issuer* dummy variable indicating whether average amount of issuer's total assets underwritten by bank *j* are

above the average amount for issuers during the sample period. Number of observations in my sample is limited to 6 541 as balance sheet data is not available for all issuers. I expect that issue size increases with issuer's size as it is reasonable that foreign banks with more extensive distribution network have larger proportion of large issuers in their portfolio. However, I find no evidence that large issuers would be treated or act differently either in general or during the crisis. In accordance with flight-to-quality effect it can be argued that large issuers would be perceived to be less risky during crisis as there is on average more information available on them and their probability to go bankruptcy is lower compared to smaller issuers. I find no evidence of such effect.

In column 2, I have included bank's total amount of underwriting mandates during the prior year relative to overall issue volume in the market as a control variable. If prior performance serves as a reputation driver, banks with relatively larger share of underwritings in the past should attain more underwriting mandates in the present. I find positive relation between amount of past underwriting activity and foreign bias. However, I find no evidence that bank's past performance would enable it to receive more underwritings during crisis. To assess how dominance of US and UK banks, which have traditionally been on top of league tables, affects my findings I have excluded these banks from my sample in column 3. My results remain similar to what was observed for the full sample.

Column 4 presents results for first time issuers. Issuer raising money first time from the bond market can be expected to be more exposed to asymmetric information than issuers who have visited the market before. Home bias in general is slightly below the one observed for the whole sample. This further supports my earlier observation of certification role that foreign banks have. As first time issuers are more pronounced to information asymmetry they are likely to employ foreign underwriters which are distant enough to alleviate information asymmetries between the issuer and investors. Notable is that foreign banks certification role gain more importance during crisis as indicated by positive and statistically significant *Foreign issue * Shock issuer country* variable. I find no evidence of increased home bias during crisis at bank's home market.

Table 7

Issuer and bank specific traits. The dependent variable is underwriting share. Column 1 includes large issuer dummy indicating whether average size of issuers underwritten by a given bank are above the average issuer size during the sample period. Column 2 includes total amount of issues underwritten by a given bank during the prior 12 months. Column 3 excludes US and UK banks when considering the prior underwritten volume by a given bank. Column 4 represents results when only issuers raising money for the first time from international bond market are during 1997-2011 are considered. Sample consists of 11 144 bank-country-month observations over the period 2002-2011. See table 1 for variable definitions. T values are presented in parentheses; standard errors (not presented) are corrected for heteroskedasticity and clustered at the bank level; *, ** and *** indicate significance at 10%, 5% and 1% level respectively.

| | (1) | (2) | (3) | (4) |
|--|----------------------|-----------------------|-----------------------------------|---------------------|
| | Large issuer | League table position | League table (no US and UK banks) | First time issues |
| Foreign issue | -0.31*** (-10.62) | -0.25*** (-7.91) | -0.26*** (-7.1) | -0.21*** (-8.04) |
| Foreign issue * Shock bank country | -0.1** (-2.27) | -0.07* (-1.9) | -0.1** (-2.23) | -0.03 (-0.84) |
| Foreign issue * Shock issuer country | 0.02 (1.23) | -0.01 (-0.44) | -0.01 (-0.46) | 0.04* (1.67) |
| Domestic issues | 1.01*** (9.74) | 0.92*** (9.36) | 0.62*** (4.59) | |
| Shock bank country | -0.12 (-1.59) | -0.07 (-1.59) | -0.04 (-1.01) | -0.28*** (-3.67) |
| Large issuer | 0.00 (0.21) | | | |
| Large issuer * Foreign issue | 0.04 (1.14) | | | |
| Large issuer * Foreign issue * Shock bank country | 0.00 (-0.08) | | | |
| Large issuer * Foreign issue * Shock issuer country | 0.03 (1.1) | | | |
| Large issuer * Shock bank country | -0.03 (-0.62) | | | |
| League table position | | -2.57*** (-7.41) | -4.12*** (-8.48) | |
| League table position * Foreign issue | | 0.53** (2.37) | 1.3*** (6.27) | |
| League table position * Foreign issue * Shock bank country | | -0.14 (-0.85) | -0.08 (-0.32) | |
| League table position * Foreign issue * Shock issuer country | | -0.02 (-0.13) | 0.07 (0.49) | |
| League table position * Shock bank country | | 1.03*** (4.44) | 1.35*** (5.59) | |
| Domestic first time issues | | | | 1.07*** (5.72) |
| Issuer country FE | Yes | Yes | Yes | Yes |
| Time FE | Yes | Yes | Yes | Yes |
| Observations | 6 541 | 11 144 | 5 792 | 4 686 |
| R-squared | 0.39 | 0.56 | 0.55 | 0.28 |

In columns 1 to 3 of table 8, I have split my sample according to issuer's previous bond issues and past relationship with the underwriting bank. In column 1, I limit my sample to issuers for whom the bank is acting as an underwriter for the first time during the past five years. Interestingly, I found that banks are biased towards foreign markets. According to *Foreign issue* variable bank's underwriting portfolio is higher by 0.05 in case of foreign issuers. When bank experiences a crisis at its home market, this effect accelerates further as indicated by positive *Foreign issue * Shock bank country* variable. There are at least two plausible explanations. Firstly, as discussed in case of first time issuers foreign banks are preferred as underwriters because of their enhanced certification capability compared to domestic underwriters. Secondly, bank experiencing a crisis at its home market is keen to look for business outside its home land. Opening new relationships with foreign issuers enables bank to diversify its exposure away from its home market where riskiness increases following the crisis. This does not contradict with earlier observed increase in home bias but shows that bank's re-allocate their risk positions following the crisis.

When limiting my sample to issuers from whom the bank has received an underwriting mandate during the past five years, I find home bias below level observed for the whole sample. Same applies for sub-sample where I include only issuers for whom the bank has lent money during the prior five years. I find no evidence that past relationship, either in form of prior underwriting mandate or direct lending would lead to variation in home bias during crisis. These results indicate that past relationship alleviates earlier observed increase in home bias to some extent.

Past lending relationship enhances bank's ability to gain underwriting mandates, and hence alleviates increase in home bias during crisis. Lending relationship incentives bank to monitor the borrower and leads to economies of scope when competing on underwriting mandates. On aggregate, this increases bank's profitability and incentives it to underwrite issues by firms to whom it has lent money in the past. When hit by crisis banks are forced to adapt their operations which is likely to lead to cut in least profitable relationships. Hence, banks are expected to cut bond origination efforts least in areas where they perceive the highest profitability potential, i.e. among their lenders. If bank lends money outside its domestic market it is fair to expect that increase in home bias during crisis is be less pronounced among its lenders.

Table 8

Past relationship. The dependent variable is underwriting share. Column 1 considers only issues by issuers for whom the underwriting bank has not acted as an underwriter during the past five years. Column 2 considers issues by issuers that the bank has acted as an underwriter during the past five years. Column 3 represents results when only issues by issuers for whom the underwriting bank has lent money during the past five years. Column 4 considers number of countries where a given bank has acted as an underwriter during the prior 12 months. Sample consists of 11 144 bank-country-month observations over the period 2002-2011. See table 1 for variable definitions. T values are presented in parentheses; standard errors (not presented) are corrected for heteroskedasticity and clustered at the bank level; *, ** and *** indicate significance at 10%, 5% and 1% level respectively.

| | (1) Non relationship issuer | (2) Issue relationship | (3) Loan relationship | (4) Diversification |
|--|--------------------------------------|------------------------------|-----------------------------|------------------------|
| Foreign issue | 0.05*** (3.46) | -0.14*** (-4.21) | -0.18*** (-6.63) | -0.22*** (-7.95) |
| Foreign issue * Shock bank country | 0.07*** (2.96) | -0.03 (-1.03) | 0.00 (-0.11) | -0.05 (-1.56) |
| Foreign issue * Shock issuer country | 0.00 (-0.35) | -0.03 (-1.44) | -0.02 (-0.77) | -0.04 (-1.34) |
| Domestic issues | | | | 0.88*** (8.54) |
| Shock bank country | -0.11*** (-4.78) | -0.15** (-2.43) | -0.19*** (-3.02) | -0.08*** (-2.86) |
| Domestic non-bond relationship issues | 0.23** (2.14) | | | |
| Domestic bond relationship issues | | 1.16*** (8.09) | | |
| Domestic loan relationship issues | | | 1.5*** (7.41) | |
| Diversification | | | | -0.02*** (-14.84) |
| Diversification * Foreign issue | | | | 0*** (2.91) |
| Diversification * Foreign issue * Shock bank country | | | | 0.00 (-1.23) |
| Diversification * Foreign issue * Shock issuer country | | | | 0.00 (1.08) |
| Diversification * Shock bank country | | | | 0.01*** (4.73) |
| Issuer country FE | Yes | Yes | Yes | Yes |
| Time FE | Yes | Yes | Yes | Yes |
| Observations | 7 979 | 5 155 | 3 070 | 11 144 |
| R-squared | 0.24 | 0.22 | 0.29 | 0.60 |

To assess to what extent my results are affected by bank's geographical diversification I have included amount of countries where bank has had an underwriting mandate during prior 12 months as a control variable. Larger the diversification, lower should be the increase in home bias during crisis. Banks that have diversified their business can be expected to be less exposed to local shocks. Results presented in column 4 indicate that more diversified banks have higher

proportion of foreign issues in their underwriting portfolio. However, I find no evidence that more diversified banks would be less pronounced to increase their level of home bias during crisis.

6.4 Familiarity traits and variation in home bias

My previous results show that power of flight-to-quality or set of issuer and bank specific traits are not adequate to explain the increase in home bias. In order to test how much familiarity considerations explain the perceived change I have included set of variables to control for similarities in issuer's and bank's cultural and national traits as well as geographical proximity and bilateral investment between their home countries.

In the first column of table 9 I have included proportion of bilateral investment from the bank's home country to the issuer's home country during the year of the issue as a control variable. I assume that if bank experiences a crisis at home it will withdraw to lesser extent from more familiar markets. There is positive relation between bank's underwriting share and investment flow from bank's home country to issuer's country as shown by positive and statistically significant *Direct investment* variable. Results are, however, insignificant when interacting *Shock issuer* and *Shock bank* country variables with *Direct investment*, indicating that proportion of direct investment from home country of the bank to the host economy does not affect bank's behavior during crisis.

In column 2, I control for geographical distance between the issuer's and underwriting bank's home market. Expectation is that amount of familiarity factors between issuer and underwriting bank decreases with distance. I find no evidence that geographically less distant foreign issuers would be preferable in bank's underwriting portfolio as such. When shock takes place in issuer's home market more distant banks are able to increase their underwriting share. Foreign banks are able to bring in new pool of foreign investors through their distribution capability which still have risk appetite compared to geographically proximate investors who are likely to become more risk averse following the crisis. It is good to bear in mind that investors' risk appetite is in the end the factor which determines the price which the issuer has to pay for the capital.

Underwriting bank that is able to bring in distant investors who perceive issuer's risk to be lower than proximate investors is pushing down issuer's cost of capital.

When shock takes place at bank's home market, I find positive relation between distance and increase in home bias. This suggests that bank's preference for more proximate and familiar issuers increase with uncertainty at bank's home market. Same results hold at both shock bank and shock issuer country level when I include only Investment Grade level issuers to my model. When limiting my sample to High Yield issues in column 4 I keep finding positive relation between the distance and shock bank country interaction but I find no inverse relation when shock takes place at issuer's home market. This is in line with my earlier observations for High Yield level issuers and indicates that banks increase their underwriting proportion in distant distressed markets only for more creditworthy issuers. Equivalent magnitude of increase in home bias for more distant players at different sub-samples when negative shock takes place at bank's home market shows that banks do not treat issuers differently according to their credit quality. This supports my conjecture that familiarity reasons explain shift in home bias to some extent. Universal shift towards more proximate and hence familiar issuers indicates increase in bank's effective risk aversion when experiencing negative shock at home.

Table 9

Familiarity measures. The dependent variable is underwriting share. Column 1 includes proportion of direct investment from bank's home economy to issuer's home country as reported by IMF's Coordinated Investment Portfolio Survey. Column 2 controls for the distance between the capital cities of bank and issuer home countries. Columns 3 and 4 control for the distance for Investment Grade and High Yield level issuers, respectively. Column 3 includes amount of issues in domestic currency of the bank in a given country during the prior 12 months. Sample consists of 11 144 bank-country-month observations over the period 2002-2011. See table 1 for variable definitions. T values are presented in parentheses; standard errors (not presented) are corrected for heteroskedasticity and clustered at the bank level; *, ** and *** indicate significance at 10%, 5% and 1% level respectively.

| | (1) Bilateral investment | (2) Distance | (3) Distance IG issues | (4) Distance HY issues | (5) Currency composition |
|---|--------------------------------|--------------------|------------------------------|------------------------------|--------------------------------|
| Foreign issue | | -0.24* (-1.75) | -0.29* (-1.94) | -0.32** (-2.06) | -0.36*** (-7.51) |
| Foreign issue * Shock bank country | | 0.33*** (2.96) | 0.55*** (3.54) | 0.27* (1.67) | 0.03 (0.29) |
| Foreign issue * Shock issuer country | | -0.27** (-2.5) | -0.49*** (-3.28) | 0.02 (0.12) | -0.04* (-1.92) |
| Domestic issues | 0.56* (-1.85) | 0.96*** (10.26) | | | 0.96*** (10.68) |
| Domestic Investment Grade issues | | | 0.93*** (8.68) | | |
| Domestic High Yield issues | | | | 3.89** (2.3) | |
| Shock bank country | -0.17 (-0.71) | -0.16** (-2.11) | -0.16** (-2.17) | -0.14 (-1.6) | -0.28* (-1.88) |
| Shock issuer country | -0.01*** (3.94) | | | | |
| Direct investment | 0.64*** (3.6) | | | | |
| Direct investment * Shock bank country | 0.12 (0.43) | | | | |
| Direct investment * Shock issuer country | 0.04 (0.2) | | | | |
| Distance | | 0.01 (-0.31) | 0.00 (0.22) | 0.01 (0.82) | |
| Distance * Shock bank country | | -0.05*** (-3.4) | -0.07*** (-3.83) | -0.04* (-1.85) | |
| Distance * Shock issuer country | | 0.03** (2.31) | 0.06*** (3.32) | 0.00 (0.12) | |
| Proportion issues in domestic currency | | | | | -0.17** (-2.26) |
| Proportion issues in domestic currency * Foreign issue | | | | | 0.08 (1.13) |
| Proportion issues in domestic currency * Foreign issue * Shock bank country | | | | | -0.18 (-1.22) |
| Proportion issues in domestic currency * Foreign issue * Shock issuer country | | | | | 0.18** (2.3) |
| Proportion issues in domestic currency * Shock bank country | | | | | 0.21 (1.48) |
| Issuer country FE | Yes | Yes | Yes | Yes | Yes |
| Time FE | Yes | Yes | Yes | Yes | Yes |
| Observations | 7 331 | 11 046 | 8 960 | 1 463 | 10 900 |
| R-squared | 0.21 | 0.32 | 0.27 | 0.32 | 0.33 |

In order to evaluate how much of the shift in home bias can be attributed to currency composition of the issue I include proportion of issues that has been underwritten in bank's domestic currency in the given country during the prior 12 months as a control variable. During a crisis bank might want to decrease its foreign exchange risk by preferring issues in its domestic currency. I find no evidence of increased home bias when shock takes place at bank's home market. When crisis hits issuer's home market, bank's foreign bias increases with proportion of prior issues nominated in banks domestic currency in that market. Banks on average are likely to have more dedicated foreign exchange research in their home currencies. When uncertainty increases in the host market banks from the same currency area gain competitive advantage over others banks, and are hence able to increase their market share.

In column 1 of table 10, I include *Common currency* dummy to my model. Results remain similar when shock takes place at issuer's home market. There is no evidence of home bias in general but negative and statistically significant value of *Common currency * Foreign issue * Shock bank country* coefficient indicates that banks decrease their exposure to foreign issuers within the common currency area when crisis takes place at their home market. Bank experiencing a crisis at its home market is vulnerable to foreign exchange risk as it is likely that the crisis leads also to impairment of the bank's home currency. Countries sharing the same currency are likely to be exposed to crisis as well which limits issues from the same currency area in general. In order to limit its exposure to the crisis bank seeks to increase proportion of underwritings in foreign currencies. However, as observed before, when shock takes place at host market within the same currency area bank is able to increase its proportion of issues in that market.

To study further relevance of familiarity factors in banks underwriting behavior I have included common language, religion and legal system dummy variables to my model. Home bias relieves when foreign issuer and underwriting bank share a common language as indicated by positive value of *Common language * Foreign issue* variable. I find no evidence that banks' preference to underwrite issuers from common language area would grow when crisis takes place either in bank's or issuer's home market. I find similar results when including *Common legal system* variable to my model in column 3. As can be seen from column 4 religion dummy has no statistical power in my model.

Table 10

Common characteristics. The dependent variable is underwriting share. Column 1 includes dummy variable indicating if bank has common home currency with the issuer. Column 2 controls for common language. Column 3 includes dummy variable indicating whether bank and issuer have similar prevailing legal system in their home countries. Column 4 controls for common religion between the bank and issuer's home country. Sample consists of 11 144 bank-country-month observations over the period 2002-2011. See table 1 for variable definitions. T values are presented in parentheses; standard errors (not presented) are corrected for heteroskedasticity and clustered at the bank level; *, ** and *** indicate significance at 10%, 5% and 1% level respectively.

| | (1) | (2) | (3) | (4) |
|--|---------------------|----------------------|----------------------|---------------------|
| | Currency | Language | Legal system | Religion |
| Foreign issue | -0.29*** (-10.1) | -0.31*** (-11.38) | -0.29*** (-10.31) | -0.28*** (-9.88) |
| Foreign issue * Shock bank country | -0.08** (-2.34) | -0.08** (-2.1) | -0.09*** (-2.7) | -0.11*** (-2.87) |
| Foreign issue * Shock issuer country | -0.02 (-1.4) | 0.01 (0.68) | 0.00 (-0.02) | 0.00 (-0.05) |
| Domestic issues | 0.96*** (9.73) | 0.95*** (9.42) | 0.99*** (10.93) | 0.99*** (10.82) |
| Shock bank | -0.17** (-2.17) | -0.16** (-2.16) | -0.15* (-1.87) | -0.14* (-1.84) |
| Common currency * Foreign issue | 0.06 (0.83) | | | 0.03 (1.45) |
| Common currency * Foreign issue * Shock bank country | -0.33*** (-2.62) | | | 0.05 (1.14) |
| Common currency * Foreign issue * Shock issuer country | 0.41*** (3.41) | | | -0.02 (-0.61) |
| Common language * Foreign issue | | 0.06* (1.82) | | |
| Common language * Foreign issue * Shock bank country | | 0.00 (0.08) | | |
| Common language * Foreign issue * Shock issuer country | | -0.05 (-1.33) | | |
| Common legal system * Foreign issue | | | 0.06** (2.52) | |
| Common legal system * Foreign issue * Shock bank country | | | 0.03 (0.93) | |
| Common legal system * Foreign issue * Shock issuer country | | | -0.01 (-0.54) | |
| Common religion * Foreign issue | | | | 0.03 (1.45) |
| Common religion * Foreign issue * Shock bank country | | | | 0.05 (1.14) |
| Common religion * Foreign issue * Shock issuer country | | | | -0.02 (-0.61) |
| Issuer country FE | Yes | Yes | Yes | Yes |
| Time FE | Yes | Yes | Yes | Yes |
| Observations | 11 140 | 11 144 | 10 170 | 10 170 |
| R-squared | 0.33 | 0.32 | 0.33 | 0.32 |

6.5 Robustness checks

In order to test that my results are not driven by underlying differences between domestic and foreign issuers I have included variables to control for average contract terms of issues underwritten by each bank in the given market during preceding 12 months. Results presented in table 10 shows that increased home bias remains. To test if observed increase in home bias during crisis is a consequence of larger issue size of foreign transactions in general I have included *Average issue amount* variable to my model in column 1. If issue sizes are relatively larger for foreign issuers, increased home bias would be at least partly explained by relatively bigger drop in issue volumes of large issues during crisis. Statistically significant *Average issue amount* variable suggests that prior issue volume has some explanatory power in my model.

In column 2, I have added variables to control for average gross spread and average maturity of the transactions during the prior 12 months. Statistically significant *Average maturity* variable indicates that maturities of prior issues underwritten by a bank i in the given country explain my findings to some extent. I fail to find evidence of increased home bias during crisis indicating that my results are somewhat driven by difference in underlying characteristics between domestic and foreign issuers. Moreover, I find negative and statistically significant values for *Foreign issue * Shock issuer country* variable indicating that foreign demand shocks have some influence on my findings.

Table 12 presents results when using alternative measures to control for the increased uncertainty in the bank's and the issuer's home country. In column 1, I use monthly stock market performance in home country of the bank and the issuer as an alternative measure for crisis. Stock market performance both, in the home country of the bank and the issuer is eligible measure of shock. This shows that banking crisis measure which I use throughout my study is robust measure of market sentiment in general.

Table 11

Contract terms. The dependent variable is underwriting share. Column 1 controls for the average amount of issues underwritten by bank i in country j during the prior 12 months. In column 2, I include issue amount, gross spread and maturity to control for the average contract terms offered by a bank i during prior 12 months in each country. Sample consists of 11 144 bank-country-month observations over the period 2002-2011. See table 1 for variable definitions. T values are presented in parentheses; standard errors (not presented) are corrected for heteroskedasticity and clustered at the bank level; *, ** and *** indicate significance at 10%, 5% and 1% level respectively.

| | (1) | (2) |
|--------------------------------------|---------------------|---------------------|
| | Issue amount | Contract terms |
| Foreign issue | -0.29*** (-9.36) | -0.25*** (-7.13) |
| Foreign issue * Shock bank country | -0.05 (-1.37) | 0.03 (0.98) |
| Foreign issue * Shock issuer country | -0.02 (-1.18) | -0.1*** (-3.64) |
| Domestic issues | 1.02*** (11.31) | 1.15*** (11.78) |
| Shock bank country | -0.15** (-2.2) | -0.24*** (-3.33) |
| Average issue amount (USD '000) | -0.00*** (-3.49) | -0.24 (-1.49) |
| Average gross spread (%) | | 0.03 (1.24) |
| Average maturity (years) | | -0.01*** (-3.39) |
| Issuer country FE | Yes | Yes |
| Time FE | Yes | Yes |
| Observations | 8 861 | 4 920 |
| R-squared | 0.38 | 0.41 |

To assess how importance of the bond market in the given country relative to global bond market influences the observed increase in home bias I have included Bias as an alternative dependent variable to my model in column 2. If there is no home bias in distribution of underwriting mandates banks would be expected to have their underwriting portfolio allocated globally according to importance of national capital markets relative to each other. Increase home bias in this context would be reflected as a positive value of *Foreign issue * Shock bank country* variable. According to my results, home bias increases by 60% when bank experiences a crisis at its home market, a figure which is significantly higher compared to 27% in my initial model. Correspondingly, when shock takes place at the issuer's home market bank's foreign bias increases by over 50%. These results support my earlier findings and show that my results cannot be explained by relative importance of some countries compared to others.

Table 12

Alternative measures. The dependent variable is underwriting share with the exception of column 2 where the dependent variable is Bias measuring home bias in the underwriting portfolio of bank i in country j as defined by Ahearne et al (2004). In column 1, I have used monthly performance of stock market in home country of the bank and the issuer to control for increased uncertainty in the market respectively. In column 2, I use Bias as a dependent variable, computed as one minus the ratio of the underwriting share to the total amount of issues in that market relative to global issue volume at time t . Sample consists of 11 144 bank-country-month observations over the period 2002-2011. See table 1 for variable definitions. T values are presented in parentheses; standard errors (not presented) are corrected for heteroskedasticity and clustered at the bank level; *, ** and *** indicate significance at 10%, 5% and 1% level respectively.

| | (1) Stock returns | (2) Bias |
|---|----------------------|---------------------|
| Foreign issue | -0.33*** (-11.62) | 30.05*** (4.83) |
| Market return in bank country | -0.23 (-1.25) | |
| Foreign issue * Market return in bank country | 0.38* (1.77) | |
| Foreign issue * Market return in issuer country | -0.16* (-1.65) | |
| Domestic issues | 1.02*** (9.73) | |
| Foreign issue * Shock bank country | | 18.03* (1.88) |
| Foreign issue * Shock issuer country | | -15.48** (-2.57) |
| Shock bank country | | 15.25 (0.98) |
| Issuer country FE | Yes | Yes |
| Time FE | Yes | Yes |
| Observations | 10 397 | 11 144 |
| R-squared | 0.28 | 0.13 |

To make sure that my results are not explained by differences in syndicate composition during normal times and crisis I have included controls for structure of the underwriting syndication in table 13. In column 1, I use number of issues instead of underwriting amount as a dependent variable. I keep finding statistically significant increase in home bias with a similar magnitude compared to my initial findings. This clearly shows that my results are not driven by change in number of issues the bank is able to attain in domestic versus foreign markets.

In column 2, I use average number of participants in issues where given bank acted as an underwriter as a dependent variable. Results show that foreign issues have larger underwriting syndication in general. I find no change in average number of underwriting banks for foreign issues when bank experiences a crisis at its home market. When shock takes place at the issuer's

home market I find increase in number of underwriting banks used in the deal. This is in line with my earlier observation of increased certification for foreign distressed issuers. Large underwriting group is likely to have on average more certification power than a small underwriting group.

Table 13

Syndicate composition. In column 1, the dependent variable is number of issues bank has underwritten during time t in country j relative to total number of issues that bank underwrites at time t . In column 2, dependent variable is average number of participating banks in issues underwritten by bank i in country j at time t . In column 1 I control for number of domestic issues in country j at time t relative to total number of issues during t . In column 2, I control for number of underwriting banks participating in issues where at least one bank is domestic. Sample consists of 11 144 bank-country-month observations over the period 2002-2011. See table 1 for variable definitions. T values are presented in parentheses; standard errors (not presented) are corrected for heteroskedasticity and clustered at the bank level; *, ** and *** indicate significance at 10%, 5% and 1% level respectively.

| | (1) Underwriting share # issues | (2) # participants |
|---|---------------------------------------|-----------------------|
| Foreign issue | -0.28*** (-10.45) | 0.26* (1.78) |
| Foreign issue * Shock bank country | -0.09*** (-2.68) | -0.17 (-0.78) |
| Foreign issue * Shock issuer country | 0 (0.35) | 0.23* (1.85) |
| Number of domestic issues | 1.08*** (12.2) | |
| Lead bank share in domestic issues | | |
| Number of participants in domestic issues | | 0.5*** (28.06) |
| Shock bank country | -0.15* (-1.89) | 0.64** (2.47) |
| Issuer country FE | Yes | Yes |
| Time FE | Yes | Yes |
| Observations | 11 144 | 11 144 |
| R-squared | 0.35 | 0.41 |

7. CONCLUSION

In this paper I study how negative shock taking place at the home market of the bank affects level of home bias in its country level underwriting portfolio. I hypothesize that bank experiencing a crisis at its home market becomes more risk averse and thus prone to withdraw from foreign markets which it observes to become more risky relatively to its home market. Methodology used in this study follows by large the one introduced by Giannetti and Laeven (2012) in their paper on syndicated loan market. Diverge from their study I concentrate on bank's role as an intermediary between bond issuers and investors. Thus, my results are not comparable with the reference study per se. However, I am able to show that the flight home effect introduced by Giannetti and Laeven is not restricted to syndicated loan market but prevails also when bank's effective risk position is limited to issue process of a bond.

I find that proportion of foreign issues in bank's underwriting portfolio decreases by 27% when hit by crisis at its home market. The effect is limited to transparent and higher quality issuers, indicating homogeneous treatment of more opaque and lower credit quality issuers during crisis independent of their geographic origin. I also find clear evidence of increased preference for issuers domiciled in markets where sovereign credit quality is higher than the one in bank's home economy, indicating that my results are to some extent driven by flight-to-quality considerations. Moreover, I show that banks treat such foreign and domestic issuers equally with whom they have had a relationship in the past, either in form of syndicated loan or prior bond issue.

I find that geographical distance between the mandated bank and the issuer is positively correlated with the increase in bank's home bias during crisis. I find no evidence that common familiarity traits between the bank and a foreign issuer would dilute the increase in home bias. However, I do observe that banks seek to limit their currency exposure by withdrawing to larger extent from foreign markets within the same currency area when hit by crisis at their home market. I also find that banks increase their exposure in distressed markets within the same currency area when not hit by crisis at home. My hypotheses and main results are presented in table 14.

Table 14

Hypotheses and results. This table summarizes hypotheses and main results.

| Hypothesis | Result |
|--|--|
| H1 <i>Bond issuers prefer geographically proximate banks when distributing underwriting mandates.</i> | Strong support. Banks are biased towards their home markets in general. Amount of issues in banks underwriting portfolio per country is lower by some 30% for foreign issuers. |
| H2 <i>Home bias in distribution of bond underwriting mandates increases during adverse economic conditions.</i> | Strong support. Banks decrease amount of issues in foreign markets relatively more compared to their home market when experiencing a crisis at home. Decrease in monthly amount is 27% for foreign markets. |
| H3 <i>Increase in home bias is a result of bank's preference to underwrite higher credit quality issuers during crisis.</i> | Medium support. When experiencing a crisis at their home market, banks withdraw to lesser extent from countries where underlying sovereign credit quality is higher than the one in their home market. |
| H4 <i>Prior relationship between the underwriting bank and the issuer alleviates increase in home bias.</i> | Medium support. Banks treat their relationship firms equally independent of their home origin when crisis hits banks' home market. |
| H5 <i>Decrease in proportion of foreign underwritings during crisis is smaller for more reputable banks.</i> | No support. More reputable banks have relatively larger exposure in foreign markets. There is no evidence that more reputable banks would withdraw to lesser extent from foreign markets during adverse economic conditions at their home country |
| H6 <i>Increase in home bias is less pronounced when the underwriting bank share common familiarity characteristics with the issuer.</i> | Medium support. Banks withdraw to lesser extent from markets which are geographically closer. No evidence that banks would withdraw less from markets which share common legal origin, language or religion with them. |

7.1 Avenues for future research

Aim of this study is to assess variation of home bias over time in distribution of international bond underwriting mandates and seek reasons which can help us to understand the ultimate cause of the home bias phenomenon in this context. Existing literature on the variation of home bias over time is yet limited and offers interesting topics to be studied in the future.

My findings serve wide range of paths for future research. Results presented in this study are from the period where crisis is still ongoing, thus serving a good starting point for a research in the future. It will be interesting to see how increase in home bias observed here will shape when economic conditions relieve. Also, my research scope is rather extensive leaving room to study the phenomenon more in detail within different geographical regions or among issuers from specific industries. Foremost, as results of this study are limited to decision making between the bond issuer and the underwriting bank, it would be interesting to see how home bias varies over time at level of individual bond investors and their allocation of capital among different bond issues.

WORKS CITED

- Acharya, V., Hasan, I. & Saunders, A., 2006. Should banks be diversified? Evidence from individual bank loan portfolios. *Journal of Business*, pp. 1355-1412.
- Ahearne, A., Grier, W. & Warnock, F., 2004. Information costs and home bias: An analysis of U.S. holding of foreign equities. *Journal of International Economics*, pp. 313-336.
- Arena, M. P. & Dewally, M., 2012. Firm location and corporate debt. *Journal of Banking & Finance*, pp. 1079-1092.
- Bae, K.-H. & Goyal, V., 2009. Creditor rights, enforcement, and bank loans. *Journal of Finance*, pp. 823-860.
- Bae, K.-H., Stulz, R. & Tan, H., 2008. Do local analysts know more? A cross-country study of the performance of local analysts and foreign analysts. *Journal of Financial Economics*, pp. 581-606.
- Barberis, N., forthcoming. Psychology and the financial crisis of 2007-2008. In: Haliassos, M. (Ed.), *Financial Innovation and the Crisis*. MIT Press.
- Beber, A., Brandt, M. A. & Kavajecz, K. A., 2008. Flight-to-quality or flight-to-liquidity? Evidence from the euro-area bond market. *Review of Financial Studies*, p. 925-957.
- Bernanke, B., Gertler, M. & Gilchrist, S., 1996. The financial accelerator and the flight to quality. *Review of Economics and Statistics*, pp. 1-15.
- Bohn, H. & Tesar, L., 1996. US equity investment in foreign markets: portfolio rebalancing or return chasing?. *American Economic Review*, pp. 77-81.
- Booth, J. & Smith, R., 1986. Capital raising, underwriting and the certification hypothesis. *Journal of Financial Economics*, pp. 261-281.
- Butler, A. W., 2008. Distance still matters: evidence from municipal bond underwriting. *Review of Financial Studies*, pp. 2757-2788.

- Carter, R. B., 1992. Underwriter reputation and repetitive public offerings. *Journal of Financial Research*, pp. 341-354.
- Chemmanur, T. J. & Fulghieri, P., 1994. Investment bank reputation, information production, and financial intermediation. *Journal of Finance*, pp. 57-78.
- Chen, H.-C. & Ritter, J., 2000. The seven percent solution. *Journal of Finance*, pp. 1105-1131.
- Coval, J. & Moskowitz, T., 2001. The geography of investment: Informed trading and asset prices. *Journal of Political Economy*, pp. 811-841.
- Curcuro, S., Thomas, C., Warnock, F. & Wongswan, J., forthcoming. US international equity investment and past and prospective returns. *American Economic Review*.
- de Haas, R. & van Horen, N., 2011. Running for the exit: International banks and crisis transmission. *DNB Working Papers 279, Netherlands Central Bank, Research Department*.
- Diamond, D., 1991. Monitoring and reputation: The choice between bank loans and directly placed debt. *Journal of Political Economics*, pp. 689-721.
- Drucker, S. & Puri, M., 2005. On the benefits of concurrent lending and underwriting. *Journal of Finance*, pp. 2763-2799.
- Epstein, L., 2001. Sharing ambiguity. *American Economic Review*, pp. 45-50.
- Ericsson, J. & Renault, O., 2006. Liquidity and credit risk. *Journal of Finance*, p. 2219-2250.
- Fang, L. H., 2005. Investment bank reputation and the price and quality of underwriting services. *Journal of Finance*, pp. 2729-2761.
- Fernando, C. S., Gatchev, V. A. & Spindt, P. A., 2005. Wanna dance? How firms and underwriters choose each other. *Journal of Finance*, pp. 2437-2469.
- Fidora, M., Fratzscher, M. & Thimann, C., 2007. Home bias in global bond and equity markets: The role of real exchange rate volatility. *Journal of International Money and Finance*, pp. 631-655.

Forbes, K., 2010. Why do foreigners invest in the United States?. *Journal of International Economics*, pp. 3-21.

Forbes, K. & Warnock, F., 2012. Capital flow waves: Surges, stops, flight, and retrenchment. *Journal of International Economics*, pp. 235-251.

Francis, B., Hasan, I. & Waisman, M., 2007. Does geography matter to bondholders. *Working Paper*.

Gande, A., Manju, P., Saunders, A. & Ingo, W., 1997. Bank underwriting of debt securities: Modern evidence. *Review of Financial Studies*, pp. 1175-1202.

Gelos, G. & Wei, S.-J., 2005. Transparency and international portfolio holdings. *Journal of Finance*, pp. 2987-3020.

Giannetti, M. & Koskinen, Y., 2010. Investor protection, equity returns and financial globalization. *Journal of Financial and Quantitative Analysis*, pp. 135-168.

Giannetti, M. & Laeven, L., 2012. Local bias and stock market conditions. *ECGI - Finance Working Paper*.

Giannetti, M. & Laeven, L., 2012. The flight home effect: Evidence from syndicated loan market during financial crises. *Journal of Financial Economics*, pp. 23-43.

Giannetti, M. & Yafeh, Y., Forthcoming. Do cultural differences between contracting parties matter? Evidence from syndicated bank loans. *Management Science*.

Grinblatt, M. & Keloharju, M., 2001. How distance, language, and culture influence stockholdings and trades. *Journal of Finance*, pp. 1053-1073.

Guiso, L., Sapienza, P. & Zingales, L., 2012. Time varying risk aversion. *Working Paper, University of Chicago*.

Hale, G. & Santos, J., 2009. Do banks price their informational monopoly. *Journal of Financial Economics*, pp. 185-206.

- Ivkovic, Z. & Weisbenner, S., 2005. Local does as local is: Information content of the geography of individual investors' common stock investments. *Journal of Finance*, pp. 267-306.
- Johnson, S., Boone, P., Breach, A. & Friedman, E., 2000. Corporate governance in the Asian financial crisis. *Journal of Financial Economics*, pp. 141-186.
- Kanatas, G. & Qi, J., 1998. Underwriting by commercial banks: Incentive conflicts, scope economies, and project quality. *Journal of Money, Credit and Banking*, pp. 119-133.
- Kanatas, G. & Qi, J., 2003. Integration of lending and underwriting: Implications of scope economies. *Journal of Finance*, pp. 1167-1191.
- Kang, J.-K. & Liu, W.-L., 2007. Is universal banking justified? Evidence from bank underwriting of corporate bonds in Japan. *Journal of Financial Economics*, pp. 142-186.
- Kim, W. & Wei, S.-J., 2002. Foreign portfolio investors before and during a crisis. *Journal of International Economics*, pp. 77-96.
- Klein, P. & Zoeller, K., 2004. Universal-bank underwriting and conflicts of interest: evidence from German initial public offerings. *Working Paper*.
- Laeven, L. & Levine, R., 2007. Is there a diversification discount in financial conglomerates?. *Journal of Financial Economics*, pp. 331-367.
- Laeven, L. & Valencia, F., 2010. Resolution of banking crises: The good, the bad, and the ugly. *IMF Working Paper*.
- Lang, W. & Nakamura, L., 1995. 'Flight to quality' in banking and economic activity. *Journal of Monetary Economics*, pp. 145-164.
- Lau, S. T. & Yu, J., 2010. Does proximity matter in international bond underwriting?. *Journal of Banking and Finance*, pp. 2027-2041.
- Leland, H. & Pyle, D., 1977. Informational asymmetries, financial structure, and financial intermediation. *Journal of Finance*, pp. 371-387.

- Levy, H. & Sarnat, M., 1970. International diversification of investment portfolios. *American Economic Review*, pp. 668-675.
- Ljungqvist, A., Marston, F. & Wilhelm Jr., W. J., 2006. Competing for securities underwriting mandates: Banking relationships and analyst recommendations. *Journal of Finance*, pp. 301-340.
- Lóránth, G. & Morrison, A., 2012. Tying in universal banks. *Review of Finance*, pp. 481-516.
- Loughran, T., 2008. The impact of firm location on equity issuance. *Financial Management*, pp. 1-21.
- Malmendier, U. & Nagel, S., 2011. Depression babies: Do macroeconomic experiences affect risk-taking. *Quarterly Journal of Economics*, pp. 373-414.
- Mayer, T. & Zignago, S., 2011. Notes on CEPII's distances measures (GeoDist). *CEPII Working Paper*.
- McKenzie, C. R. & Takaoka, S., 2008. Underwriter reputation and switching. *Mathematics and Computers in Simulation*, pp. 215-222.
- Mian, A., 2006. Distance constraints: The Limits of foreign lending in poor economies. *Journal of Finance*, pp. 1465-1505.
- Milesi-Ferretti, G. M. & Tille, C., 2011. The great retrenchment: International capital flows during the global financial crisis. *Economic Policy*, pp. 285-342.
- Presbitero, A., Udell, G. & Zazzaro, A., 2012. The home bias and the credit crunch: A regional perspective. *working paper*.
- Puri, M., 1996. Commercial banks in investment banking conflict of interest or certification role?. *Journal of Financial Economics*, pp. 373-401.
- Rajan, R., 1992. Insiders and outsiders: The choice between informed and arm's length debt. *Journal of Finance*, pp. 1367-1400.

Seasholes, M. & Zhu, N., 2010. Individual investors and local bias. *Journal of Finance*, pp. 1987-2010.

Shivdasani, A. & Song, W.-L., 2011. Breaking down the barriers: Competition, syndicate structure and underwriting incentives. *Journal of Financial Economics*, pp. 581-600.

Sufi, A., 2007. Information asymmetry and financing arrangements: Evidence from syndicated loans. *Journal of Finance*, pp. 629-668.

Ursel, N. & Ljucovic, P., 1998. The impact of bank ownership of underwriters on the underpricing of initial public offerings. *Canadian Journal of Administrative Sciences*, pp. 17-27.

Van Nieuwerburgh, S. & Veldkamp, L., 2009. Information immobility and the home bias puzzle. *Journal of Finance*, pp. 1187-1215.

Vayanos, D., 2012. Flight to quality, flight to liquidity, and the pricing of risk. *Unpublished working paper, London School of Economics*.

Yasuda, A., 2005. Do bank relationship affect the firm's underwriter choice in the corporate-bond underwriting market. *Journal of Finance*, pp. 1259-1292.